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BUBONIC PLAGUE AND MARITIME QUARANTINE[1]

A SUGGESTED SYSTEM OF PLAGUE CONTROL, ASSUMING THAT THERE IS INFECTIBLE AND NONINFECTIBLE TERRITORY, DISCUSSING THE CHEOPIS INDEX AS A MEASURE OF INFECTIBILITY, AND ADVOCATING THE RAT-PROOFING OF SHIPS TO PREVENT THE SPREAD OF PLAGUE BY SEA

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Health officers in America who have had to deal with both yellow fever and bubonic plague during the past 30 years must have noticed interesting points of resemblance and, at the same time, been impressed with the difference in results obtained. Thirty years ago yellow fever was probably the most important quarantinable disease in the Western Hemisphere. Its position was secure and it was little affected by sanitary rules or control. Plague, on the other hand, was just beginning to reappear. Now the positions are reversed. Yellow fever has been driven back until it is all but extinct. Plague has advanced almost at will across the seas and, once in a place, has remained, or has been suppressed only after considerable effort. The diseases, however, are similar in that yellow fever is transmitted by mosquitoes from man to man, and bubonic plague is transmitted by fleas from rat to rat. It would seem to those who have had experience with both diseases that, since the two are transmitted by insects, we should compare the methods of control, especially those intended to prevent the spread of the disease over the sea, if we would learn why the results have been so brilliant with yellow fever and so unsatisfactory with regard to plague.

It is from this standpoint that the following propositions will be presented and discussed in the light of the author's practical experience of nearly 30 years with both yellow fever and bubonic plague:

1. Yellow fever is confined to warm climates; when it was present on the North American Continent it was generally south of 38° north latitude. Bubonic plague during the present pandemic has remained within the warmer zones, roughly limited by 40° north and 40° south latitude, together with the ports of the Mediterranean and Black Seas.

2. Yellow fever is spread by one species of mosquito; the *Aëdes aegypti*. Bubonic plague is ordinarily spread by one species of flea; the *Xenopsylla cheopis*.

3. A certain number of insect carriers is necessary if an insect-borne disease is to spread. It is not possible to count the actual

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number of insects as a whole; but if their relation to some object that may be easily examined can be determined, this will give the degree or index of infectibility. For plague the *cheopis* index is suggested. This would be the average number of *X. cheopis* per live rat examined.

4. In yellow-fever control, the destruction of adult *Aëdes aegypti* is no longer attempted, all efforts being concentrated to prevent the breeding and maturing of larval forms. In plague it is not practicable to take measures directly against the insect carrier. The attack must be made against its hosts, the rats. The destruction of adult rats, however, is as unprofitable as measures against adult mosquitoes in yellow fever, and our efforts should all be concentrated to prevent breeding and the development of the immature forms, namely, the young rats.

THE GEOGRAPHICAL LIMITS OF PLAGUE

It is commonly stated that disease knows no boundaries. This is true for international lines; but certain diseases at least have clearly defined limits of their own, which are quite fixed at present, but if viewed over a long period of time show a tendency to change. Climate has a certain influence in fixing the geographical limits of disease, but usually more specific factors are discovered as soon as investigations are carried far enough. As well known a disease as malaria is a good example. The localities where it exists to-day can be definitely plotted on a map, but this would be far different from a similar map made 20 years ago or one made 40 years ago. The disease and its means of spread have not changed, neither has the climate to any extent; but conditions that favor the breeding of *Anopheles* mosquitoes, in many parts of the United States at least, have ceased to exist on account of better drainage in the city and on the farm. The limits of plague and yellow fever have also changed, and it is possible in each case to give a reasonable explanation.

Early in the nineteenth century, outbreaks of yellow fever occurred in Philadelphia, New York, Boston, Baltimore, and other places as far north as Quebec. It was recognized that these were unusual, and we now believe that they were due to the rare combination of sailing vessels on which there were yellow fever cases, plus *Aëdes ægpyti* breeding on board and in water containers on shore, which allowed this breeding to continue so long as warm weather lasted. The eminent yellow fever authority, Juan Guiteras, recognized three areas of infection: The focal zone, the perifocal zone, and the zone of accidental epidemics. The so-called accidental epidemics ceased to exist long before the mosquito was thought of in connection with yellow fever. The change, therefore, did not depend upon human control, but was brought about by changes in the type of ships and in business and living conditions on the water front.

The changes in the geographical limits of plague may seem more difficult to accept, as this disease is comparatively new to us, the present so-called pandemic having existed about 30 years. Plague spread over Europe during the Middle Ages and seemed as virulent in the northern as in the southern part. When, after a latent period, it reappeared late in the nineteenth century, it faced a different world. When one reads of the terrible conditions under which men worked and lived in the days of the old plague, it is easy to understand that rats were more numerous and supported more fleas that transmit plague. The crowded, filthy living quarters undoubtedly simulated those now in warmer climates and allowed multiplication of the *X. cheopis* which, under modern living conditions, is comparatively rare in northern Europe.

Thus it will be seen that long before it was suspected that yellow fever was transmitted by a mosquito, it was believed that this disease would not spread in America north of the southern boundary of Maryland, which is about 38° north latitude. This was determined empirically, and was not only the basis of quarantine regulations but had great economic significance. Years after this arbitrary line, based on experience, had been determined, it was found that it corresponded accurately with the northern limit of the breeding of *Aëdes ægypti*. Similar observations have been made regarding plague, and quite early in the present pandemic it was observed that in India (1), where the disease was widespread, certain localities did not become infected (2) (3). These were spoken of as "islands of immunity within a sea of plague." The low-lying southern and eastern portions of the Madras Presidency escaped the disease (4), and, in Ceylon, Colombo remained immune for a considerable time, although plague was introduced and conditions were apparently favorable for its spread (5). Agra has no plague, while in Cawnpore it is severe (3). In spite of their extensive commerce with all parts of the world, the great ports of North America (6) and Europe have remained free from plague and may be presumed to be unfavorable soil for this disease. It has actually been introduced into certain ports, such as Liverpool and London, where its occurrence has terminated with a promptness that can not be entirely attributed to the excellent measures taken (7).

Beginning with the work of the Indian Plague Commission (5) and following that of Cragg (8), Hirst (9), Liston (10), White (11), Fox (12), and others, evidence has been accumulating that the *X. cheopis* is the only flea that need be considered, at least in maritime quarantine against plague. The discovery, in 1911 (5), that the predominant flea in the immune areas of India and Ceylon was *Xenopsylla astia*, and not *Xenopsylla cheopis* made possible the assertion that the presence or absence of *cheopis* is the determining factor in the infectibility

or noninfectibility of these localities. The same may be said for the ports of northern Europe and of the United States, which are in a cooler climate and in which *Ceratophyllus fasciatus* is the predominant flea and occupies the position held by *astia* in the Tropics. Both *fasciatus* and *astia* (4), as well as certain other species, may, exceptionally, transmit plague from rat to rat; but the evidence is convincing that in nature this does not occur with sufficient frequency to maintain an epidemic.

We now have the benefit of 30 years of modern experience with plague and its spread by commercial carriers, and it is entirely reasonable to assume that in this time it has outlined the areas where the bubonic type can spread under modern conditions and that, in general terms, these are between 40° north and 40° south latitude, together with the districts about the Mediterranean and the Black Sea. This assumption is based upon experience in some ways as convincing as that which first determined the limits of yellow fever; and if the cases are at all parallel, a study of rats and their ectoparasites within and without the infectible areas should make possible the determination of the relative number of insect vectors, that is, *X. cheopis*, necessary to allow the disease, once introduced, to spread.

Cragg states (8): "If it is really the case that *cheopis* is the 'plague flea' while *astia* is not, it will be possible, by an examination of the fleas of a locality, to estimate precisely its liability to plague; in fact, to map out '*cheopis*-belts' just as the 'fly belts' of Africa have been mapped out. It would clearly be unnecessary to take elaborate and expensive measures against plague in a district in which the rat fleas were a species which is not a vector of plague. The significance of an imported case of plague will depend in a large measure on the local species of flea."

Hirst states (13): "It is generally recognized that the spread of plague is influenced by a number of factors varying in importance according to circumstances; * * * the susceptibility of the rats to plague infection; the number of fleas per rat, i. e., the flea index; climate; means of communication * * *."

CHEOPIS INDEX TO MEASURE INFECTIBILITY

The term "flea index," however, that we have been using for several years is too indefinite, and it is suggested that "*cheopis* index" be substituted and that this index be the average number of *X. cheopis* per live rat, disregarding all other species of fleas. The critical *cheopis* index would then be the lowest average number of *X. cheopis* per rat necessary for plague to spread from rat to rat in an increasing ratio. It is admitted that other factors, especially the density of the rat population, will have an influence; but these other factors will be secondary. While the *cheopis* index in plague would seem to be of

less importance than the *stegomyia* index in yellow fever (the latter is easily influenced while the *cheopis* index is not), still as a measure of infectibility it may prove to be of distinct value, both in quarantine and plague suppressive measures.

Practically all of the flea surveys made until recently have given the percentages of the various species of fleas obtained, especially the ratio of *cheopis* to other varieties; but this has given no basis upon which the degree of infectibility can be determined. Cragg wrote in 1923 (2): "The available figures refer only to the relative percentage of *cheopis*. A more suitable figure would be the average number of this species per rat." A certain amount of work, however, has been done which bears directly on this proposition. In Liverpool (14) an investigation covering practically an entire year demonstrated that, although *cheopis* predominated on rats on board vessels arriving from foreign ports, averaging 1 per rat, *fasciatus* was more common on rats taken along the waterfront section of the city where *cheopis* averaged but 0.1 per rat, and *fasciatus* was almost the only flea found on rats caught in the city proper. Plague rats have reached Liverpool from vessels; and although limited outbreaks of human plague cases have occurred, some attributed to *Pulex irritans* by Letham (15), no appreciable epizootic has resulted.

Flea surveys have been undertaken in the United States at various times. They show that, in New Orleans, where plague has occurred, the average number of *cheopis* per rat was nearly 3 in May and June, 1916, and was 1.71 per rat in the 12 months beginning July 1, 1921. In Pensacola, Fla., in 1921, the year in which 36 plague-infected rats were found, the average number of *cheopis* per rat was 6.1. On the other hand, in New York, April 18, 1923 to February 28, 1925, a period of 22 months, an examination of 4,756 rats gave a *cheopis* index of 0.2165; and only in one month did this exceed 1 (October, 1923), when it was 1.25. In Boston, 1922–23, 1,524 rats gave a *cheopis* index of 0.8 per rat (16).

Some three years ago a flea survey was undertaken at the New York Quarantine Station specifically to determine the *cheopis* index at New York and at other ports where possible. It has since been extended to San Juan, P. R., Savannah, Ga., Norfolk and Newport News, Va., all reporting to New York. The Pan American Sanitary Bureau has requested the nations of Central and South America to cooperate (17), and Ecuador has responded. Practically all the figures so far available indicate that as we go north the number of *cheopis* decreases, and that it is usually less than one per rat north of 40° north latitude. It may be entirely premature to state that one *cheopis* per rat is the critical *cheopis* index, but possibly this is near enough to serve as a basis for further investigation.

As compared with the *stegomyia* index for yellow fever, certain disadvantages are easily seen. It is more difficult to examine rats than houses, the index is little affected by control measures, and the seasonal variation of *cheopis* in certain climates is considerable. Therefore, this index will probably be of less use in the control of actual plague epidemics than is the *stegomyia* index in yellow fever; but as a basis for maritime quarantine, as a record that is before us to be read from year to year, it should be of great value. Just as improvements on farm and in city have often changed the malarial situation, so better building changes the rat situation and probably the flea situation as well. This change could be watched even if nothing is done to advance it. It would be well worth while for every seaport at least to know its *cheopis* index by zones, as does Liverpool (14), where they know that *cheopis* are confined to the waterfront and feel that the rest of the city may be ignored when combating imported plague. It has been said that plague or no plague is a matter of good health departments. This is surely a factor, as a good health department should, by periodic flea surveys, plot the *cheopis* index of each part of the city, in order to watch and encourage the elimination of rat conditions that favor breeding and to know the weak spots should danger threaten.

PLAGUE CONTROL BY RESTRICTING RAT BREEDING

In modern operations against yellow fever as practiced in the United States and in the drive of the International Health Board to exterminate this disease, the entire attack is now concentrated at one point; namely, to decrease the *breeding* of the disease carriers. No longer does the yellow-fever fighter take time to hunt out the sick, although they may be infectious, nor does he fumigate to kill mosquitoes, although they may be infected. He destroys mosquito breeding places (fresh-water containers) or makes them unsuitable for mosquito breeding by screening or by the introduction of fish to eat the larvae.

It has long been known that it profits little to destroy the mature form of any animal or insect pest. "Swat the fly" may be a popular slogan, and screens may be useful, but the only efficient method is to stop fly breeding. To quote one of the axioms of the late H. R. Carter (Assistant Surgeon General, U. S. Public Health Service), "The only way to control a biological pest is to restrict its breeding."

Of the two forms of life that carry plague to man, the rat can be controlled easier than the flea which he harbors, and it is right to give him our undivided attention; but unless we work to prevent rat breeding, results must be expensive and unsatisfactory. Paterson (18) reports over 300,000 rats killed in an extensive campaign in Kenya, but concludes, "We are not yet killing enough rats to appreciably affect their numbers, which would appear to continue to be

effectually limited by the available shelter and food supply." The United States Public Health Service has for 20 years preached that, to control rats and plague, we must build houses that will afford no place where rats can breed and raise their young (19). It has shown how one pair can produce 600 rats in 18 months *if conditions are favorable;* but, it has also been shown that it is possible to make conditions unfavorable for rat breeding. It has declared officially "There is only one way to eliminate the rat. It must be built out of existence. All other measures produce only very temporary results" (20).

Notwithstanding, maritime quarantine methods against plague rely almost entirely upon the fumigation of ships, although it is admitted that fumigation as ordinarily done can not kill all the rats on board any given ship. This was shown by the "outgoing quarantine" at Porto Rico in 1912, where, on account of the severe infection on shore, great pains were taken to insure that each ship allowed to sail was absolutely rat-free (21). Fumigation has been controlled by trapping at New York (22) and New Orleans (23), and in both cases it was found that additional rats could be caught immediately after fumigation in sufficient numbers to show that fumigation had not been more than 70 to 80 per cent efficient. Where ships have been refumigated on account of suspected plague infection, the second, third, and often the fourth fumigations have yielded considerable numbers of rats. It is, therefore, no wonder that plague has continued its steady march to all ports of the world within the infectible zone. On the other hand, a ship with few or no rats does not carry plague, and the permanent rat population of a ship will remain below the danger point upon those vessels originally built without rat harbors, such as most tankers and certain vessels constructed under rat-proof specifications or those subsequently "rat proofed."

A "rat-proof ship" is simply one that has no permanent rat harborages and on which rats can not go from one compartment to another except by the passageways designed for man. On such a ship it is impossible, or difficult, for rats to hide, nest, or travel about in search of food. Rats may get on such a ship, but, once on board, it will be impossible or difficult for them to hide, except temporarily, and they can not move from one compartment to another in search of food and water. "In other words, they will be confronted with the high cost of living due to an acute housing problem and poor transportation between home and business (food getting). Laboring under these disadvantages, rats will be exposed to acute rivalry among themselves, to their enemies, and to starvation. They will breed with difficulty and, instead of multiplying, will decrease or even disappear" (24). Ship rat proofing has passed the experimental stage. Many of the large vessels entering New York have completed the work. It

was done by the owners without any Government coercion. The United States Navy and the Army Transport Service have recognized the value of rat proofing and are making practical use of it on their vessels.

Since a ship is not dangerous unless it has on board a certain number of rats, fumigation or any other form of deratization may be omitted if this number is not present and if, in addition, conditions—which means rat harborage—are not favorable for breeding. The Liverpool port sanitary authorities for the past 20 years have employed rat searchers who devote their whole time to searching ships and quays for sick or dead rats, four ordinarily working on ships arriving from ports where plague has been prevalent during recent times, and one on the docks. This work has many times demonstrated its value in detecting plague on vessels before it could be found in rats taken by trapping or fumigation. The port sanitary inspectors inspect systematically the dock area for rat evidence and rat harborage for the enforcement of rat proofing.

At that port, fumigation of ships is required only when there is any suspicion of plague infection among the rats on board, to comply with the requirements of certain foreign governments, and when the investigations of the rat searchers and rat catchers indicate that the vessel is "rat infested." Each rat catcher and rat searcher "is supplied with an electric torch, and by noting such evidence of rats as the quantity of excreta and whether it is fresh or stale, runs and holes, the gnawing of woodwork, damage to cargo, etc., they are able to judge the degree to which a vessel is rat infested" (25).

It has always been assumed that but a small number of rats get aboard or leave a ship in cargo; hence the practice in the United States of allowing vessels to discharge before fumigation. Recent investigations confirm this view and show that a large proportion of all rats on ships are born on board and that the rat population will remain as large as rat-living conditions will allow. This permanent rat population is the real danger. It can be reduced by ratproofing on ships with greater certainty than on shore where it has long been practiced. Trapping and fumigation are excellent measures, but their effects are temporary.

It has been shown that by careful examination the number of rats can be estimated with considerable accuracy, as it is theoretically possible to locate the home and trace the nightly trips of each rat (26). This was demonstrated in 1913, when a detailed inspection and elaborate preparation of the ship were shown by Grubbs and Holsendorf to be a prerequisite of a satisfactory fumigation (21). It was shown at that time that rats will be found wherever they have protection, and it was next seen that if each harborage must be located and opened before a perfect fumigation can be done, we might just as well

abolish permanently these harborages, after which fumigation becomes of secondary importance.

It requires a trained and conscientious personnel to make an accurate and satisfactory inspection to locate rat infestation and harborage (but not much more so than is needed for good fumigation). It is advantageous that the conditions looked for do not change rapidly, so that the accuracy of such inspections may be checked any time. It is, of course, essential that such an inspection be made only when the part inspected is empty, but it need not necessarily all be done on the same day. The superstructure can be inspected almost any time, and the various cargo spaces and storerooms as they happen to be empty. Detailed records should be kept showing the exact condition of each and every part of the ship. It seems reasonable to suggest that deratization (fumigation) should be required of a ship showing any rat infestation whatever, or any appreciable rat harborages, if the vessel is from an infected port. It would probably be safe to allow, tentatively, five rats on vessels from noninfected ports of a high degree of infectibility—that is, between 40° north and 40° south latitude—and 10 rats from ports of a low degree of infectibility—that is, north of 40° north and south of 40° south latitude. If any appreciable amount of rat harborages exists, it must be assumed that rats may be or can be present, and in that case deratization, or abolition of the harborage, is called for.

Maritime quarantine, when operating at its maximum efficiency, has been compared to a screen that holds back the grosser impurities but allows commerce to flow through it without impediment. If, in striving for perfection, this screen is made too fine, it will block the stream so that it will break down the obstruction or flow around it. Constant study is necessary to determine the usual routes of infection in order that they may be blocked; but despite laboratory demonstrations, those obviously not commonly followed in nature should be disregarded in quarantine, or quarantine becomes complicated and burdensome.

CONCLUSIONS

1. The present plague pandemic has existed over a period of 30 years, during which time plague has probably been brought to most of the ports of the world. In some of these ports this infection remains to-day or was suppressed with great effort; in others it gained no footing or died out with little or no intervention. The former may be considered infectible; the latter noninfectible or infectible with difficulty.

2. Infectible ports are apparently included in a zone between 40° south latitude and 40° north latitude, plus the ports of the Mediterranean and Black Seas.

3. *Xenopsylla cheopis* is probably the only flea that transmits plague from rat to rat in nature; and if this is true, for the purposes of maritime quarantine other species may be disregarded.

4. A *cheopis* index will measure the infectibility of any locality to plague. It is suggested that this index be the average number of *X. cheopis* per live rat. The critical *cheopis* index would then be the figure above which plague once introduced would increase. This critical point may be determined by repeated studies of the *cheopis* index in ports shown to be infectible and those apparently non-infectible.

5. The number of rats on board a vessel may be estimated with reasonable accuracy by means of a detailed inspection by a trained inspector.

6. On vessels, as well as in buildings, the number of rats is limited by the amount of rat harborage and available food. The most economical way, and the only permanent way, to get rid of rats is to build them out (rat proof).

7. Rat proofing will reduce the number of rats that can survive on board a ship to zero or to a negligible number. Rat proofing on vessels follows the same principle as rat proofing in buildings, but has the advantage of a rat-proof foundation furnished by the sea. Eliminate rat harborage, make food unavailable, and stop rat travel from one part of a ship to another and the existence of rats on a ship becomes almost impossible.

8. Rat proofing of vessels is practicable and has demonstrated its value in dollars and cents to the ship owner. If made a part of the original construction of the ship, it need add no extra cost. If done later, the cost is slight and is far outweighed by the benefits.

9. The need of fumigation or similar measures to destroy rats presupposes the presence of rats on board a vessel. If a vessel is rat free, fumigation to kill rats is manifestly unnecessary, regardless of the sanitary condition of ports that have been visited by the vessel.

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DIPHTHERIA IMMUNIZATION IN ASBURY PARK, N. J.

Immunization against diphtheria was begun among the children of the public schools in Asbury Park, N. J., in 1923, and has been continued to date. In that year Schick tests were made on 170 school children 4 to 16 years of age. One hundred and twenty-two of these children were found to be susceptible and were immunized by a series of three injections of toxin-antitoxin. After a period of six months, the Schick test was again applied, and all who were found positive were given a second series of injections of the toxin-antitoxin mixture. The same procedure was followed in 1924. In 1925 the plan of giving the toxin-antitoxin injections to all pupils under 7 years of age was begun, the first injection being a Park test. A record was kept of those found susceptible, but all were given the series of toxin-antitoxin injections. After one year, Schick tests were made, and pupils showing a positive reaction received a second series of immunizing doses. The second series was not followed by a Schick test. This practice has been continued since 1925.

During the period 1923 to date, 2,036 Schick tests and 1,278 Park tests have been given, 1,023, or 50.2 per cent, of the former and 934, or 73.1 per cent, of the latter being positive. These pupils received one or more of the series of toxin-antitoxin injections with no unfavorable result in any instance.

Health Officer B. H. Obert, who has furnished the information regarding this work, states that the Bureau of Education and the Board of Health cooperated, the former furnishing the physician and public-health nurse, the latter supplying the material and the services of its staff. This included one person to bear the arm, one to prepare the site, one to fill the syringe, and a recorder, thus leaving for the physician simply the administration of the material. With this system the prophylactic treatments were given at the rate of from 80 to 100 pupils per hour.

The diphtheria record for Asbury Park from 1920 to 1926, inclusive, is as follows:

Year—	Cases
1920	12
1921	8
1922	12
1923	1
1924	7
1925	3
1926	1

The same number of cases of diphtheria were recorded in each of the years 1920 and 1922—the year before the work was begun—as were recorded in the four years 1923–1926.

The following tables, furnished by Health Officer Obert, summarize the work by years and give the percentages of susceptibles found, by age and by sex:

Schick tests (primary), 1923

Age	Males		Females		Totals			Per cent susceptible		
	Susceptible	Immune	Susceptible	Immune	Total	Susceptible	Immune	Males	Females	Total
4	0	0	0	0	0	0	0	0	0	0
5	3	0	2	0	5	5	0	100	100	100
6	9	2	6	3	20	15	5	82	67	75
7	9	3	9	1	22	18	4	75	90	82
8	7	7	6	1	21	13	8	56	86	65
9	8	1	5	6	20	13	7	88	46	65
4-9	36	13	28	11	88	64	24	74	72	73
10	11	2	8	4	25	19	6	85	67	76
11	8	6	5	2	21	13	8	57	71	62
12	5	3	3	1	12	8	4	62	75	67
13	6	0	6	1	13	12	1	100	86	92
14	1	5	1	0	7	2	5	16	100	29
9-14	31	16	23	8	78	54	24	66	74	69
15	1	0	1	0	2	2	0	100	100	100
16	0	0	2	0	2	2	0	0	100	100
15-16	1	0	3	0	4	4	0	100	100	100
Adults	0	0	0	0	0	0	0	0	0	0
Total	68	29	54	19	170	122	48	61	74	72

Schick tests (primary), 1924

Age	Males		Females		Totals			Per cent susceptible		
	Susceptible	Immune	Susceptible	Immune	Total	Susceptible	Immune	Males	Females	Total
4	4	3	8	0	15	12	3	57	100	80
5	19	4	11	1	35	30	5	83	91	85
6	23	1	22	4	50	45	5	95	84	90
7	30	18	46	8	102	76	26	62	85	74
8	23	14	43	24	104	66	38	62	64	63
9	25	18	40	20	103	65	38	58	66	63
4–9	124	58	170	57	409	294	115	68	75	73
10	22	20	30	11	83	52	31	52	73	62
11	29	14	35	12	90	64	26	67	74	71
12	30	19	31	13	93	61	32	61	71	65
13	26	10	26	8	70	52	18	72	76	74
14	20	14	25	7	66	45	21	58	78	68
9–14	127	77	147	51	402	274	128	62	74	68
15	11	5	7	7	30	18	12	68	50	60
16	8	1	9	1	19	17	2	88	90	89
15–16	19	6	16	8	49	35	14	76	67	72
Adults	1	1	14	7	23	15	8	50	66	65
Total	271	142	347	123	883	618	265	66	74	70

Park tests, 1925

Age	Males		Females		Totals			Per cent susceptible		
	Susceptible	Immune	Susceptible	Immune	Total	Susceptible	Immune	Males	Females	Total
4	11	2	12	3	28	23	5	85	80	82
5	31	16	24	9	80	55	25	66	10	69
6	30	20	37	10	97	67	30	60	80	69
7	23	7	22	8	60	45	15	77	73	33
8	13	9	20	4	46	33	13	59	83	72
9	12	4	21	2	39	33	6	75	91	15
4–9	120	58	136	36	350	256	94	67	79	73
10	14	9	21	3	47	35	12	61	88	74
11	14	1	13	5	33	27	6	66	72	81
12	8	6	8	3	25	16	9	57	73	64
13	9	9	4	4	26	13	13	50	50	50
14	4	7	5	3	19	9	10	36	63	47
9–14	49	32	51	18	150	100	50	61	74	66
15	2	3	2	2	9	4	5	40	50	44
16	1	4	2	0	7	3	4	20	100	43
15–16	3	7	4	2	16	7	9	30	66	44
Adults	3	2	6	1	12	9	3	60	86	75
Total	175	99	197	57	528	372	156	64	78	70

Schick tests (secondary), 1925

Age	Males		Females		Totals			Per cent susceptible		
	Susceptible	Immune	Susceptible	Immune	Total	Susceptible	Immune	Males	Females	Total
4	0	5	0	5	10	0	10	0	0	0
5	0	7	1	6	14	1	13	0	14	6
6	2	14	3	22	41	5	36	13	12	12
7	9	14	6	17	46	15	31	39	26	35
8	7	18	13	21	59	20	39	28	36	34
9	11	13	6	23	53	17	36	46	21	32
4–9	29	71	29	94	223	58	165	29	23	26
10	4	18	10	18	50	14	36	18	36	28
11	5	16	7	10	38	12	26	24	41	32
12	6	8	6	10	30	12	18	43	38	40
13	7	12	10	8	37	17	20	37	18	46
14	2	3	1	12	18	3	15	40	8	17
9–14	24	57	34	58	173	58	115	30	37	34
15	4	2	3	5	14	7	7	66	38	50
16	2	2	3	3	10	5	5	50	50	50
15–16	6	4	6	8	24	12	12	60	43	50
Adults	1	0	5	2	8	6	2	100	71	75
Total	60	132	74	162	428	134	294	31	69	32

Park tests, 1926

Age	Males		Females		Totals			Per cent susceptible		
	Susceptible	Immune	Susceptible	Immune	Total	Susceptible	Immune	Males	Females	Total
4	3	0	0	0	3	3	0	100	0	100
5	20	3	24	2	49	44	5	87	92	90
6	14	7	17	3	41	31	10	66	85	75
7	12	6	13	6	37	25	12	66	68	68
8	14	13	10	5	42	24	18	52	66	57
9	7	6	12	7	32	19	13	54	63	59
4–9	70	35	76	23	204	146	58	66	77	71
10	6	6	9	0	21	15	6	50	100	71
11	8	7	13	3	31	21	10	53	81	68
12	8	6	9	1	24	17	7	57	90	71
13	5	7	6	4	22	11	11	42	60	50
14	7	7	6	1	21	13	8	50	86	61
9–14	34	33	43	9	119	77	42	60	83	65
15	2	3	1	0	6	3	3	40	100	50
16	2	3	1	0	6	3	3	40	100	50
15–16	4	6	2	0	12	6	6	40	100	50
Adults	0	0	1	0	1	1	0	0	100	100
Total	108	74	122	32	336	230	106	59	79	68

Schick tests (secondary), 1926

Age	Males		Females		Totals			Per cent susceptible		
	Susceptible	Immune	Susceptible	Immune	Total	Susceptible	Immune	Males	Females	Total
4	0	0	0	1	1	0	1	0	0	0
5	0	1	0	3	4	0	4	0	0	0
6	5	10	8	18	41	13	28	33	31	32
7	7	17	9	18	51	16	35	29	33	32
8	5	15	2	11	33	7	26	25	15	21
9	1	13	4	14	32	5	27	6	22	21
4-9	18	56	23	65	162	41	121	24	26	25
10	2	12	4	13	31	6	25	14	23	19
11	2	7	4	23	36	6	30	22	15	17
12	3	12	3	9	27	6	21	20	25	22
13	4	7	5	6	22	9	13	36	45	41
14	2	3	3	6	14	5	9	40	33	36
9-14	13	41	19	57	130	32	98	25	25	25
15	0	3	1	2	6	1	5	0	33	83
16	0	0	1	2	3	1	2	0	33	33
15-16	0	3	2	4	9	2	7	0	20	22
Adults	1	0	2	4	7	3	4	100	50	43
Total	32	100	46	130	308	78	230	24	26	25

Park tests, 1927

Age	Males		Females		Totals			Per cent susceptible		
	Susceptible	Immune	Susceptible	Immune	Total	Susceptible	Immune	Males	Females	Total
4	3	1	11	0	15	14	1	75	100	93
5	27	2	32	1	62	59	3	93	97	95
6	32	3	26	3	64	58	6	91	90	91
7	30	4	10	3	47	40	7	88	77	85
8	19	5	15	4	43	34	9	56	79	81
9	11	5	10	4	30	21	9	69	71	70
4-9	122	20	104	15	261	226	35	86	87	87
10	12	5	10	5	32	22	10	71	66	69
11	8	6	13	7	34	21	13	57	65	62
12	5	5	14	0	24	19	5	50	100	79
13	5	4	12	0	21	17	4	56	100	81
14	3	2	6	2	13	9	4	60	75	69
9-14	33	22	55	14	124	88	36	60	80	71
15	7	3	2	1	13	9	4	70	66	69
16	1	3	3	2	9	4	5	25	60	44
15-16	8	6	5	3	22	13	9	57	63	59
Adults	0	1	5	1	7	5	2	0	83	71
Total	163	49	169	33	414	332	82	77	84	80

Schick tests (secondary), 1927

Age	Males		Females		Totals			Per cent susceptible		
	Susceptible	Immune	Susceptible	Immune	Total	Susceptible	Immune	Males	Females	Total
4	0	0	0	0	0	0	0	0	0	0
5	0	3	0	1	4	0	4	100	0	0
6	7	12	4	16	39	11	28	37	20	28
7	5	12	9	7	33	14	19	29	56	33
8	1	9	5	8	23	6	17	10	38	26
9	6	12	3	12	33	9	24	33	20	27
4-9	19	48	21	44	132	40	92	28	32	28
10	6	8	5	12	31	11	20	43	29	35
11	1	5	3	7	16	4	12	17	30	25
12	1	4	5	7	17	6	11	20	42	35
13	0	7	4	4	15	4	11	0	50	27
14	0	8	3	7	18	3	15	0	30	17
9-14	8	32	20	37	97	28	69	20	35	29
15	0	4	0	2	6	0	6	0	0	0
16	0	1	0	3	4	0	4	0	0	0
15-16	0	5	0	5	10	0	10	0	0	0
Adults	2	0	1	5	8	3	5	100	17	33
Total	29	85	42	91	247	71	176	25	32	29

Summary of Schick and Park tests in Asbury Park, 1923 to 1927, inclusive

	Schick	Park
Total number of tests	2,036	1,278
Males	948	668
Females	1,088	610
Total found susceptible	1,023	934
Males	460	446
Females	563	488
Total number found immune	1,013	344
Males	488	222
Females	525	122
Per cent found susceptible	50.2	73.1
Males	48.5	66.8
Females	51.7	80.0

STATE HOSPITALS AS RESEARCH UNIT IN THE STUDY OF MENTAL DISEASES

The Massachusetts Department of Mental Diseases has instituted a novel and promising experiment in the field of mental research, the development of which will be watched with considerable interest by psychiatrists. It is planned to make use of the State hospital system in Massachusetts in the scientific study of psychiatry and mental hygiene, and of the development of the epidemiology of mental diseases and mental deficiency. These institutions afford a mass of data which can be readily and economically made available and which, when studied and analyzed, will no doubt add materially to the knowledge of mental diseases that has so far for the most part been contributed by studies of individual cases.

There is printed below an excerpt from the presidential address delivered by Dr. George M. Kline, commissioner of mental diseases of Massachusetts, at the eighty-third annual meeting of the American Psychiatric Association, held at Cincinnati, May 31 to June 3, 1927. This excerpt is taken from the Monthly Bulletin for June, published by the Massachusetts Society for Mental Hygiene.

No State hospital system can adequately or conscientiously fulfill its duty to the public and to suffering humanity without giving considerable thought to the question of research. Without the research spirit and without the development of an adequate machinery for research, we can make progress only by intuition or by guesswork. It has gradually come to me that the centralization of the State hospitals is not only of prime value to administration, but is essential to research in our field. The State is, indeed, the logical unit to undertake research of this sort. This is true for many reasons. First, statistically speaking, the effects of emigration and immigration are greatly minimized because of the large population found in a State. Second, in most States, systems of vital statistics have been developed which we can utilize in our studies. Third, we have a larger amount of disease and disorder affecting the human population under observation, treatment, and control in our State hospitals than we have in any other type of disease whether mental or physical.

Our vital statistics of to-day, excellent as they may be, concern themselves almost always, when they are reasonably adequate, with deaths, births, marriages, and divorce. On the other hand, in the field of morbidity—that is, of illness—we find that present-day statistics are in the main quite inaccurate and often valueless. However, in the case of a State hospital system there is under observation and under control probably the majority of the persons seriously ill with mental disease. The State hospital system, well centralized, therefore offers a wonderful opportunity to make studies of morbidity in the field of mental disease which is far superior to any study of morbidity which to-day can be made in the other fields of medicine.

Every effort is now being made by intelligent State departments of health and by the United States Public Health Service to make fairly accurate studies of morbidity, feeling that in these studies lies the possibility of a very great advance in preventive medicine. It is equally desirable that funds be made available for a study of morbidity in the field of mental disease and mental deficiency. With a well-centralized State hospital system like that in Massachusetts this is certainly not impossible and can be done economically. I hope that in the near future the Massachusetts Department of Mental Diseases will make, by a scientific study of morbidity, a monumental contribution to psychiatry and mental hygiene and, incidentally, to the development of the epidemiology of mental disease and mental

deficiency. In my opinion, an analysis of the mass data which a centralized State system economically makes available will result in scientific information of value equal to, if not greater than, that which has already been contributed by studies of individual cases.

COURT DECISIONS RELATING TO PUBLIC HEALTH

Statute prohibiting the sale and manufacture of oleomargarine declared void.—(Wisconsin Supreme Court; John F. Jelke Co. *v.* Emery, State Dairy and Food Commissioner, and three other cases, 214 N. W. 369; decided June 20, 1927.) Chapter 279 of the 1925 session laws added the following new section to the statutes:

352.365 (1) It shall be unlawful for any person, firm, or corporation, by himself, his servant or agent, or as servant or agent of another, to manufacture, sell or solicit or accept orders for, ship, consign, offer or expose for sale or have in possession with intent to sell, any article, product or compound which is or may be used as a substitute for butter and which is made by combining with milk or milk fats or any of the derivatives of either any fat, oil, or oleaginous substance or compound thereof other than milk fat.

(2) Any person violating this section shall, for the first offense, be punished by a fine of not less than $50 nor more than $500, and for each subsequent offense by imprisonment in the county jail not less than 10 days nor more than six months or by a fine of not less than $100 nor more than $500, or by both such fine and imprisonment.

The enforcement of this law by the State dairy and food commissioner was sought to be enjoined on the ground that it was violative of the State and Federal constitutions. The trial court held the act unconstitutional and its judgment was affirmed by the supreme court. The following are extracts from the latter court's opinion:

We shall therefore, in considering the questions raised, regard the statute as one which prohibits the sale and manufacture of oleomargarine, as that term is known and understood both in law and in commerce. * * *

Chapter 279 was passed in the exercise of the police power. It prohibits the carrying on of a legitimate, profitable industry and the sale of a healthful, nutritious food. This prohibition can only be justified upon the ground that it is necessary in order to protect the public health, public morals, public safety, prevent fraud, or promote the public welfare. As already indicated, the public health is not endangered by the manufacture and sale of oleomargarine, and certainly no question of morals is involved. There is not the slightest evidence that the prohibition is justified in order to prevent fraud, because under the evidence there is no fraud, and certainly there is not such a state of affairs as enables the court to take judicial notice of a fact which in five years has not come to the attention of the dairy and food commissioner. * * *

It would seem that decisions could not make plainer the fact that any law which prohibits the manufacture and sale of uncolored oleomargarine violates the Constitution of the United States and of the State of Wisconsin. * * *

We are next urged to hold the act valid on the ground that the legislature, in order to protect the Wisconsin dairy industry from unfair competition, may

prohibit the manufacture and sale of oleomargarine. There is no basis in the evidence upon which a claim of unfair competition can be based. * * *

Under the facts proven in this case, whatever the economics of the situation may be, from the standpoint of constitutional right the legislature has no more power to prohibit the manufacture and sale of oleomargarine in aid of the dairy industry than it would have to prohibit the raising of sheep in aid of the beef cattle industry, or to prohibit the manufacture and sale of cement for the benefit of the lumber industry. In some cases a proper exercise of the police power results in advantage to a particular class of citizens and to the disadvantage of others. When that is the principal purpose of the measure, courts will look behind even the declared intent of legislatures, and relieve citizens against oppressive acts, where the primary purpose is not to the protection of the public health, safety, or morals. * * *

In this case, it is not shown that it is necessary, in order to protect the public health or prevent fraud, to prohibit the sale of oleomargarine. Chapter 279 is therefore a void enactment. * * *

Death certificate as evidence.—(Oklahoma Supreme Court; Oklahoma Aid Ass'n *v.* Thomas, 256 P. 719; decided April 19, 1927.) An action was brought to recover on a benefit certificate and the aid association sought to defend on the ground that the decedent had committed suicide, which fact, under the constitution and by-laws of the association, would make the certificate null and void. A certified copy of the death certificate pertaining to the decedent, which was introduced in evidence, gave the cause of death as gunshot wound and indicated that the case was one of suicide.

A State law provided as follows:

* * * Any such copy of the record of a birth or death, when properly certified by the State registrar, shall be prima facie evidence in all courts and places of the facts therein stated.

The supreme court decided that the trial court erred in admitting the death certificate in evidence as proof of who inflicted the wound. The following is quoted from the court's opinion:

It is our opinion that the legislature, when they inserted the words "(probably) accidental, suicidal, or homicidal," did not intend that said death certificate, when introduced in evidence, should be held to make out a prima facie case of homicide or suicide. * * *

It is our opinion that the legislature provided for the keeping of vital statistics in the exercise of its police power for the purpose of keeping an accurate record of births and deaths and of the diseases causing death, and so that the health authorities may be better enabled to combat diseases. The attending physician or coroner might be able to state the cause of death, just as was stated here, gunshot wound. But to go further and state by whom inflicted would change all the rules of evidence in cases in which this certificate could be admitted.

We agree with the defendant that the record of births and deaths, when properly kept as required by law and made a matter of public record by statutes, as such are admissible in evidence for certain purposes. But we can not agree that a certified copy thereof would be admissible for the purpose of showing who inflicted the gunshot wound. * * *

In this case there is no question but that the deceased died of gunshot wound. The certificate was not essential to establish the cause of death, but was offered by the defendant in an effort to prove suicide or who inflicted the mortal wound. * * *

Sewage pollution of stream by city.—(Connecticut Supreme Court of Errors; Donnelly Brick Co., Inc., *v.* City of New Britain, 137 A. 745; decided June 6, 1927.) In an action brought against the city of New Britain because of damage to plaintiff's property caused by the pollution of a brook and the overflow of its polluted waters, the supreme court of errors stated the applicable principles of law as follows:

The plaintiff was entitled, as a riparian owner, to have this brook flow through its land as it had been accustomed to flow, as a right inseparately annexed to its soil. Nolan *v.* New Britain, 69 Conn. 668, 681, 38 A. 703. The defendant city had no right to appreciably or materially pollute the brook and thus cause a nuisance and impair plaintiff's rights in it. Stamford Extract Mfg. Co. *v.* Stamford Rolling Mills Co., 101 Conn. 310, 322, 125 A. 623. "If a municipal corporation, in the absence of a legal right so to do, causes sewage to pollute a watercourse, to the use of which a lower owner, through whose premises the watercourse flows, is entitled, it is guilty of a nuisance, for which damages may be recovered." Nolan *v.* New Britain, supra, at page 678 (38 A. 706). * * * * * * The city could not support its pollution of this stream upon the ground of its public necessity. * * *

Section of labor law relating to laundries construed.—(New York Supreme Court; Van Zandt's, Inc., *v.* Department of Labor of State of New York et al., 222 N. Y. S. 450; decided June 11, 1927.) Section 296 of the labor law and rule 1700 of the industrial code provided, respectively, as follows:

SEC. 296. *Laundries.*—A shop, room, or building where one or more persons are employed in doing public laundry work by way of trade or for purposes of gain is a factory within the meaning of this chapter and subject to the provisions relating to factories. No such public laundry work shall be done in a room used for sleeping or living purposes. All such laundries shall be kept in a clean condition and free from vermin and from all impurities of an infectious or contagious nature. This section shall not apply to a female doing custom laundry work at her home for regular family trade.

Rule 1700. The term "laundry" shall mean an establishment wherein public laundry work is done by way of trade or for purposes of gain, and in which the washing, ironing, or other finishing of clothes or other textiles is accomplished by the use of power-driven machinery.

It was held that these provisions applied to a laundry operated by the plaintiff for the purpose of laundering new collars and shirts manufactured at its factory.

PUBLIC HEALTH ENGINEERING ABSTRACTS

Critical and Experimental Studies of Pasteurization of Milk. (Kritische und Experimentelle Studien zur Pasteurisierung der Milch.) H. Brand. Thesis, Eidg. Tech. Hochsch., Zurich, 1925. 91 pages. From Experiment Station Record, United States Department of Agriculture, vol. 56, No. 5, April, 1927, p. 473.

"The first part of this publication deals with the purpose of Pasteurization, the resulting changes in the milk, and methods and regulations for Pasteurization in force in Europe and America. The second portion of the work deals with the efficiency of Pasteurization for destroying bacteria and prolonging the keeping qualities of cow's and human milk. The results of these studies showed that Pasteurization at 63° C. (145.4° F.) for 30 minutes killed all the pathogenic organisms but did not materially affect the keeping qualities. The findings were similar when human milk was Pasteurized."

Investigation of Current Relations in Agitator Flash Pasteurizers and Their Influence on the Death of Organisms. K. Richter and H. M. Wendt. (Milchw. Forsch., 3 (1926), No. 2-3, pp. 200-208.) From Experiment Station Record, United States Department of Agriculture, vol. 56, No. 5, April, 1927, p. 474.

"The amount of direct flow through two types of flash Pasteurizers was determined by first sending skim milk and then whole milk through the Pasteurizers. The length of time that different portions remained in the container was estimated from the fat content of the milk coming out.

"The results showed that in one type of Pasteurizer, which was cylindrical in shape, portions of the milk passed through in a few seconds while other portions remained for as long as 4 minutes. The top of the other type of Pasteurizer was larger in diameter than the bottom. The maximum and minimum time required for milk to go through this type was 70 and 15 seconds, respectively. In the latter type the destruction of *B. coli* was very complete."

Effect of Different Temperatures on the Bacterial Flora of Milk. Martin J. Purcha, Professor of Dairy Bacteriology, University of Illinois, Urbana. *American Journal of Public Health*, vol. 7, No. 4, April, 1927, pp. 356-359.

"The work was started about three years ago but is not yet completed. This paper is only a preliminary report.

"The problem has been attacked along two different lines. First, the effect of Pasteurization on the entire bacterial flora as found in the milk is being studied collectively. Samples of the raw milk are procured from different localities and during the different seasons of the year. These samples of milk are Pasteurized in the laboratory and the bacterial flora of the milk is studied before and also after the Pasteurization. The effect on the keeping quality of the milk is also observed. Second, the different bacterial species that are found in the milk are obtained in pure cultures and are then subjected to the Pasteurizing temperature.

"The results so far obtained correspond in general with the results of the previous investigators. The Pasteurization reduces the bacterial count in the milk in general about 99 per cent. However, under certain conditions the milk may become heavily contaminated with bacteria that are resistant to the Pasteurizing temperature. When that happens, the Pasteurized milk will have high bacterial counts.

"The flora usually consists of varying numbers of different species, each species varying in numbers from day to day.

"The various methods employed in connection with the milk production and the milk handling affect the number of bacteria and also affect the percentages of the different species. Not only the methods of operation but also the weather and the climatic temperatures will affect the bacterial flora of the milk.

"The source of these bacteria has not been fully demonstrated in all cases. There is some evidence that they come from the utensils. Incomplete steaming of the utensils causes some of these organisms to survive while those that are more sensitive to heat may be completely destroyed.

"The heat-resisting bacteria do not grow very fast in the milk when the milk is kept at lower temperatures. They do not seriously affect the keeping quality

of the milk when the milk is kept at 60° F. or lower. However, the high counts in freshly Pasteurized milk, whether the counts are due to the thermophiles or to the heat-resisting bacteria or to the spore-producing bacteria, should always be considered to indicate a neglect somewhere along the journey of the milk as it passes from the cow to the final container, the bottle."

The Treatment of Milk by an Electrical Method. Samuel C. Prescott. *American Journal of Public Health*, vol. 17, No. 3, March, 1927, pp. 221–223. (Abstract by Malcolm Lewis.)

Experiments in Great Britain by Professor Beattie and Sir Oliver Lodge in 1914 resulted, after some years, in a process by which milk, subjected to the action of electric current, was heated quickly, uniformly, and completely to accurately controlled temperatures. Brief treatments of only a fraction of a minute effectively destroyed such pathogens as tubercle, typhoid, and colon bacilli without noticeable change in the appearance or taste of the milk. Introduction into the United States resulted in changes of design, operation, and technical improvements tending toward simplified operation and automatic control.

The author's personal study of a commercial installation covered about a year. Milk was pumped through the apparatus at such speed that 220 volts alternating 60-cycle current raised the temperature to 158–160° F., and at that speed 12 seconds were required to pass the milk through the treating chamber. The results showed great uniformity of treatment, normal taste and cream volume, and excellent keeping quality. The reduction of bacteria was highly efficient. No colon nor tubercle bacilli were found among the surviving types.

Sewage Treatment Experiments at Houston, Texas. W. S. Stanley. Proceedings of the Ninth Texas Water Works Short School, Texas Section, Southwest Water Works Association, pp. 288–292. (Abstract by Chester Cohen.)

The earliest sewage treatment experiments with activated sludge in Houston were begun about 1914 and have continued since that time. A number of the interesting fundamentals established through this work are given. It was proved that, when the quantity of air supplied was less than 0.2 cubic foot free air per square foot of water surface per minute there was a noticeable falling off in the results, and when the amount of air per square foot was in excess of 0.25 the improvement was not proportional to the quantity of air supplied. Tanks with a depth of less than 7½ feet, with ordinary agitation, would not give the best results. The problem of combating the clogging of the filtros plates, due to iron rust, was solved through the immersing of the plates for a few hours in a 10 per cent solution of hydrochloric acid. It is now believed that the use of concrete holders and dust removers for cleaning the air will give the plates a life of at least five years.

The lagooning of sludge (a form of separate sludge digestion) has not been altogether satisfactory. Methods of sludge dewatering were tried. In 1917 the old process of flotation was employed, embodying the use of soda ash and sulphuric acid with the application of heat to evolve CO_2. The best results were obtained with 105 pounds of soda ash and 268 pounds of sulphuric acid per ton of dry product with a temperature of 45° C. The resulting sludge, however, had about 97 per cent water, and obviously such a method was not practicable. In 1921 a dewatering plant was put into operation which consisted of three cyprus sludge settling tanks of 50,000 gallons capacity each, two plate and frame filter presses, and one direct indirect heat rotary dryer. This plant had a capacity of 10 tons of dry sludge per day. Attempts were made to filter the sludge directly as received from the aerating tanks and also after acidification with sulphuric acid and sulphur dioxide gas, the final cost of the product being as follows: Unconditioned sludge, $38.90; conditioned with sulphuric acid, $33.85; conditioned

with sulphur dioxide, $39.30. The high cost of operating the filter presses and the short life of the filter cloth has caused the abandonment of the process.

A standard wet machine such as used in the paper industry was installed, but cost of replacement of screens, loss of solids, and nonconsistent results caused the abandonment of this process. More recent experiments using a 4-foot American continuous vacuum filter with aluminum sulphate or ferric salts as conditioning reagents have been tried. Hydrogen ion concentration has been used as a guide for the conditioning process. The optimum pH for filtration with ferric chloride is about 5.4, and with alum sulphate about 4.8. It is expected to produce a sludge cake containing from 80 to 82 per cent moisture at a cost within economic limits and which can be further dried in the rotary dryer. Experiments in 1926 using a conditioning agent and running the sludge so treated on to drying beds for partial drying were not successful, due to climatic conditions and odors and other nuisances produced before the sludge had time to dry sufficiently to be removed from the beds. Other experiments to prevent the rising of sludge blankets in the settling tanks through the use of chlorine were tried. Experiments on the iron content of sludge have indicated that, so far as Houston conditions are concerned, the iron content has no effect on purification.

Experiments with very concentrated packing house waste indicate that surface aeration by mechanical apparatus is equal in cost of power to that of diffused air. Standard purification was accomplished by the first method in 36 hours, as compared to 12 hours with activated sludge. With normal domestic sewage, however, there may be attained a greater power economy using surface aeration.

Separate Sludge Digestion. Jerry Donohue. *The American City*, vol. 36, No. 5, pp. 633–636. (Abstract by D. W. Evans.)

The method of sewage disposal by separate sludge digestion is briefly discussed in this article, and the operation and construction features of two plants in Wisconsin are described.

The city of Hartford built a plant of this type in 1924, and it has given satisfactory service. Sewage first passes through a coarse bar screen and the screenings are removed to sludge bed. The screened sewage passes to the clarifier, where the suspended solids are removed. A Dorr mechanism is used for concentrating the sludge, and the thickened sludge is removed daily to a separate tank for digestion. The average detention period in the clarifier is 2¾ hours, and the time necessary for pumping sludge is 30 minutes daily.

The digestion tank has a capacity of 3 cubic feet per capita based on an ultimate population of 5,500. This tank is also equipped with a Dorr mechanism for breaking up the scum so that gases may escape. The incoming sludge is distributed evenly on the surface by means of a channel riding with the revolving mechanism.

Sludge is removed by static head to a concrete drying bed. The underdrainage system is of tile with brick covering. Over the brick are placed 18 inches of stone and 6 inches of sand. The area of the bed provides a capacity of 0.6 square feet per capita. Official tests conducted by the Wisconsin State Board of Health established the fact that the raw sewage was extremely strong for domestic sewage and that a removal of 73 per cent by weight of the suspended solids was accomplished. Sludge has been withdrawn five times without any complaints from adjacent landholders. The operating cost of this plant was $630 for 1925.

A similar installation was recently completed at the city of Antigo, except that provisions were made for securing better operation during cold weather by the addition of a cover for the digestion tank, a gas collector, and heating unit for the sludge. The gas is used as fuel for heating the plant and the sludge, and is

equivalent to 200 pounds of coal per day over a nine months' period. The gas maintains a temperature of 65° F. in the digestor.

The following advantages of separate sludge digestion are noted: The tanks are shallow and cheaper to build than two-story tanks; the mechanism employed in the tank takes the place of hand work; the type of plant is flexible, and the capacity of either tank can be enlarged without necessity of enlarging both; the elevation of sludge in the digestor permits gravity distribution to drying beds; the collection of gas which, when burned, eliminates odors and conserves fuel in the plant; this type removes the solids as much as others; the mechanical features need supervision and better efficiency is secured than a nonmechanical plant in which supervision is often neglected.

A Simple and Successful Septic Tank. E. J. Van Meerten, Lecturer in Engineering, Grootfontein School of Agriculture, Middleburg, Cape. Bulletin No. 15, Union of South Africa Department of Agriculture. 12 pages. (Abstract by W. A. Hardenbergh.)

The tank described as being best suited for private dwellings in South Africa is large compared with our standards, having a capacity of about 1,260 gallons. It is of the 3-compartment type, connection between the compartments being by means of a drop pipe 5 feet 4 inches long reaching within 6 or 8 inches of the tank bottom. Disposal of the effluent is through a stone-filled well reaching to a trench drain. The estimated cost, including a "convenience" (toilet) is £60 (about $295). Users are cautioned against discharging wash or bath water or kitchen slops into the tank. Doubt is expressed as to the workability of the tank in tight soil.

Abstractor's note: Tanks much smaller than this give excellent results in the United States. Tight soil requires more careful installation, but does not preclude satisfactory use. The very long drop pipe is not satisfactory in this country, 18 inches having been found best.

Sewer Plant Pays Dividends. R. E. McDonnel. *Western Construction News*, vol. 2, No. 8, April 25, 1927, pp. 42–43. (Abstract by E. A. Reinke.)

The author discusses the advantage of sewers under the headings, "Benefits of water works made available," "Sewers an inducement to factories," "Cost less than cesspools and privies," "Sewers enhance property values," and "No community can afford to be without sewers." He states that an average of 132 cities show sewers to cost about one-half as much as the waterworks. He concludes with the statement, "After 25 years of experience in sanitary engineering work the writer can unhesitatingly say that no improvement will pay better dividends than the installation of a modern system of sanitary sewers; and when once properly installed, it is self-cleansing, and as lasting as time itself. No community can afford to be without this improvement."

REPORT OF THE UNITED STATES PUBLIC HEALTH SERVICE ON THE MONTREAL TYPHOID-FEVER SITUATION—CORRECTION

In the report on the typhoid-fever situation in Montreal, Canada, published in Public Health Reports for July 22, 1927, the second sentence in the second paragraph on page 1895 should read, "Exactly where" etc., instead of "Exactly when" etc.

DEATHS DURING WEEK ENDED JULY 30, 1927

Summary of information received by telegraph from industrial insurance companies for week ended July 30, 1927, and corresponding week of 1926. (From the Weekly Health Index, Aug. 3, 1927, issued by the Bureau of the Census, Department of Commerce)

	Week ended July 30, 1927	Corresponding week 1926
Policies in force	67, 800, 438	65, 046, 262
Number of death claims	11, 794	11, 393
Death claims per 1,000 policies in force, annual rate	9.1	9.1

Deaths from all causes in certain large cities of the United States during the week ended July 30, 1927, infant mortality, annual death rate, and comparison with corresponding week of 1926. (From the Weekly Health Index, Aug. 3, 1927, issued by the Bureau of the Census, Department of Commerce)

City	Week ended July 30, 1927		Annual death rate per 1,000 corresponding week 1926	Deaths under 1 year		Infant mortality rate, week ended July 30, 1927 [2]
	Total deaths	Death rate [1]		Week ended July 30, 1927	Corresponding week 1926	
Total (64 cities)	5,771	10.5	[3] 10.9	632	[3] 668	[4] 53
Akron	34			5	3	54
Albany [5]	39	16.9	11.4	4	1	83
Atlanta	73			11	9	
White	38			5	5	
Colored	35	(6)		6	4	
Baltimore [5]	174	11.1	14.5	22	24	68
White	132		12.3	13	14	50
Colored	42	(6)	27.2	9	10	140
Birmingham	64	15.5	13.8	9	6	
White	23		9.8	1	2	
Colored	41	(6)	20.1	8	4	
Boston	207	13.6	13.0	27	26	75
Bridgeport	24			2	2	37
Buffalo	90	8.5	12.0	9	15	38
Cambridge	26	10.9	9.8	4	4	71
Camden	20	7.8	13.9	7	9	120
Canton	27	12.5	8.5	3	2	71
Chicago [5]	584	9.8	9.2	66	48	57
Cincinnati	114	14.4	16.2	16	16	100
Cleveland	159	8.4	8.0	8	22	21
Columbus	69	12.4	15.4	10	8	93
Dallas	34	8.5	14.4	7	14	
White	26		12.7	6	12	
Colored	8	(6)	25.1	1	2	
Dayton	40	11.6	13.0	6	3	99
Denver	67	12.0	11.9	7	5	
Des Moines	26	9.1	10.4	2	3	33
Detroit	230	9.0	8.6	32	26	51
Duluth	19	8.6	6.9	2	0	43
El Paso	27	12.3	17.2	3	12	
Erie	18			2	5	39
Fall River [5]	25	9.8	9.2	2	2	35
Flint	18	6.6	5.0	5	1	82
Fort Worth	29	9.2	7.2	2	2	
White	23		6.7	2	2	
Colored	6	(6)	11.0	0	0	
Grand Rapids	38	12.5	9.4	0	6	0
Houston	45			4	1	
White	31			3	1	
Colored	14	(6)		1	0	
Indianapolis	104	14.5	13.2	9	11	71
White	82		12.1	9	6	81
Colored	22	(6)	21.3	0	5	0
Jersey City	54	8.7	8.5	6	3	45
Knoxville	33	16.9		4		
White	31			3		
Colored	2	(6)		1		

See footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended July 30, 1927, infant mortality, annual death rate, and comparison with corresponding week of 1926—Continued

City	Week ended July 30, 1927		Annual death rate per 1,000 corresponding week 1926	Deaths under 1 year		Infant mortality rate, week ended July 30, 1927 [2]
	Total deaths	Death rate [1]		Week ended July 30, 1927	Corresponding week 1926	
Los Angeles	235			32	22	92
Louisville	72	11.7	15.6	7	13	60
White	53		13.2	5	10	49
Colored	19	(6)	28.8	2	3	140
Lowell	29	13.7	10.4	4	1	77
Lynn	23	11.4	4.0	1	1	26
Memphis	70	20.4	16.8	9	9	
White	31		13.7	5	3	
Colored	39	(6)	22.3	4	6	
Milwaukee	93	9.1	10.3	12	22	56
Minneapolis	88	10.4	10.6	8	9	45
Nashville [5]	58	21.9	24.4	6	8	
White	36		18.6	4	2	
Colored	22	(6)	38.8	2	6	
New Bedford	19	8.3	9.2	5	5	87
New Haven	34	9.6	9.2	3	3	42
New Orleans	129	15.9	15.1	21	13	
White	69		10.6	7	4	
Colored	60	(6)	27.7	14	9	
New York	1,151	10.0	10.2	120	119	50
Bronx Borough	126	7.1	9.3	4	12	13
Brooklyn Borough	387	8.9	8.3	56	44	58
Manhattan Borough	487	14.0	13.7	47	54	55
Queens Borough	104	6.7	6.7	8	6	34
Richmond Borough	47	16.7	16.4	5	3	93
Newark, N. J.	69	7.7	8.7	5	9	25
Oklahoma City	28			7	2	
Omaha	32	7.6	13.0	3	3	33
Paterson	39	14.1	8.4	1	1	18
Philadelphia	364	9.3	12.0	35	47	47
Pittsburgh	127	10.3	11.3	14	15	49
Portland, Oreg	86			6	3	63
Providence	43	8.0	10.2	7	8	59
Richmond	47	12.8	11.6	4	13	53
White	22		9.3	0	4	0
Colored	25	(6)	17.1	4	9	152
Rochester	62	10.0	10.2	4	7	34
St. Louis	195	12.1	13.1	19	23	
St. Paul	42	8.8	7.8	4	1	36
Salt Lake City [5]	34	13.0	5.9	5	1	76
San Antonio	58	14.3	16.3	9	16	
San Diego	38	17.2	14.2	2	2	43
San Francisco	120	10.9	10.2	7	8	44
Schenectady	9	5.0	4.5	1	0	39
Seattle	68			3	3	31
Somerville	16	8.2	8.9	1	2	36
Spokane	23	11.0	15.8	2	3	50
Springfield, Mass	25	8.9	11.9	1	3	15
Syracuse	39	10.3	10.1	7	2	90
Tacoma	24	11.7	10.3	1	1	24
Toledo	34	5.8	12.0	7	5	67
Trenton	28	10.7	14.0	3	2	52
Washington, D. C.	126	12.2	8.3	10	10	58
White	77		7.1	7	6	59
Colored	49	(6)	11.7	3	4	55
Waterbury	17			2	2	47
Wilmington, Del	14	5.8	10.1	3	4	74
Worcester	36	9.6	12.4	6	2	72
Yonkers	12	5.3	6.7	2	2	45
Youngstown	32	9.9	8.2	1	6	14

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Data for 63 cities.
[4] Data for 60 cities.
[5] Deaths for week ended Friday, July 29, 1927.
[6] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta 31, Baltimore 15, Birmingham 39, Dallas 15, Fort Worth 14, Houston 25, Indianapolis 11, Knoxville 15, Louisville 17, Memphis 38, Nashville 30, New Orleans 26, Richmond 32, and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Week Ended August 6, 1927

DIPHTHERIA	Cases
Alabama	17
Arizona	1
Arkansas	4
California	72
Colorado	13
Connecticut	17
Florida	4
Georgia	16
Illinois	59
Indiana	20
Iowa [1]	15
Kansas	4
Louisiana	18
Maryland [1]	17
Massachusetts	43
Michigan	33
Minnesota	14
Mississippi	7
Missouri	14
Montana	3
Nebraska	1
New Jersey	61
New Mexico	12
New York [2]	39
North Carolina	34
Oklahoma [3]	12
Oregon	6
Pennsylvania	121
Rhode Island	3
South Carolina	29
South Dakota	2
Tennessee	9
Texas	23
Utah [1]	6
Washington	10
West Virginia	9
Wisconsin	35
Wyoming	1

INFLUENZA	Cases
Alabama	7
California	2
Connecticut	1
Florida	8
Georgia	24
Illinois	1
Indiana	3
Kansas	8
Louisiana	1
Maine	1
Maryland [1]	3
Massachusetts	2
Michigan	2
Missouri	2
New Jersey	1
Oklahoma [3]	7
Oregon	2
South Carolina	119
Tennessee	4
Texas	35
Wisconsin	7

MEASLES	
Alabama	32
Arizona	2
Arkansas	14
California	58
Colorado	16
Connecticut	19
Florida	3
Georgia	7
Illinois	38
Indiana	10
Iowa [1]	5
Kansas	37
Louisiana	5
Maine	14
Maryland [1]	11

[1] Week ended Friday.

[2] Exclusive of New York City and Rochester.

[3] Exclusive of Oklahoma City and Tulsa.

MEASLES—continued

	Cases
Massachusetts	85
Michigan	39
Minnesota	8
Missouri	11
Montana	3
Nebraska	35
New Jersey	4
New Mexico	14
New York [2]	117
North Carolina	130
Oklahoma [2]	53
Oregon	6
Pennsylvania	140
South Carolina	84
South Dakota	21
Tennessee	13
Texas	14
Utah [1]	1
Vermont	24
Washington	75
West Virginia	23
Wisconsin	116
Wyoming	4

MENINGOCOCCUS MENINGITIS

California	6
Colorado	1
Georgia	1
Illinois	8
Iowa [1]	1
Kansas	3
Louisiana	1
Michigan	1
Minnesota	2
Missouri	1
Montana	2
New Jersey	1
New York [2]	1
North Carolina	2
Oklahoma [2]	1
Pennsylvania	3
Tennessee	1
Texas	1
Washington	1
Wisconsin	10

POLIOMYELITIS

Arkansas	1
California	56
Connecticut	11
Georgia	1
Illinois	6
Indiana	2
Kansas	4
Louisiana	3
Massachusetts	10
Michigan	3
Minnesota	1
Missouri	15
Montana	1
New Jersey	17
New Mexico	9
New York [1]	6
Oklahoma [2]	8

POLIOMYELITIS—continued

	Cases
Oregon	2
Pennsylvania	5
South Carolina	2
Tennessee	1
Texas	10
Utah [2]	1
Virginia	2
Wisconsin	2
Wyoming	1

SCARLET FEVER

Alabama	15
Arizona	1
Arkansas	1
California	68
Colorado	20
Connecticut	10
Florida	3
Georgia	13
Idaho	1
Illinois	72
Indiana	18
Iowa [1]	13
Kansas	27
Louisiana	5
Maine	13
Maryland [1]	13
Massachusetts	82
Michigan	77
Minnesota	32
Mississippi	1
Missouri	22
Montana	14
Nebraska	9
New Jersey	31
New Mexico	12
New York [2]	73
North Carolina	16
Oklahoma [2]	7
Oregon	7
Pennsylvania	112
Rhode Island	9
South Carolina	14
South Dakota	14
Tennessee	15
Texas	11
Utah [1]	8
Vermont	4
Washington	18
West Virginia	15
Wisconsin	44
Wyoming	2

SMALLPOX

Alabama	4
Arkansas	2
California	6
Colorado	2
Georgia	1
Idaho	2
Illinois	9
Indiana	28
Iowa [1]	10
Kansas	6

[1] Week ended Friday.

[2] Exclusive of New York City and Rochester.

[3] Exclusive of Oklahoma City and Tulsa.

SMALLPOX—continued

	Cases
Michigan	15
Mississippi	2
Montana	3
Nebraska	5
New York [2]	3
North Carolina	13
Oklahoma [3]	7
Oregon	5
Pennsylvania	1
South Carolina	10
South Dakota	6
Tennessee	3
Texas	10
Utah [1]	1
Virginia	2
Washington	16
West Virginia	8
Wisconsin	18
Wyoming	1

TYPHOID FEVER

	Cases
Alabama	92
Arizona	1
Arkansas	48
California	12
Colorado	6
Connecticut	1
Delaware	1
Florida	9
Georgia	93
Idaho	4
Illinois	37
Indiana	12
Iowa [1]	1
Kansas	21
Louisiana	26
Maine	1
Maryland [1]	24
Massachusetts	3
Michigan	9
Minnesota	9
Mississippi	20
Missouri	13
Montana	7
Nebraska	1
New Jersey	12
New Mexico	8
New York [2]	12
North Carolina	70
Oklahoma [3]	96
Oregon	4
Pennsylvania	52
Rhode Island	4
South Carolina	89
Tennessee	144
Texas	28
Utah [1]	3
Vermont	1
Washington	4
West Virginia	30
Wisconsin	6

TYPHOID FEVER—continued

[1] Week ended Friday.

[2] Exclusive of New York City and Rochester.

[3] Exclusive of Oklahoma City and Tulsa.

Reports for Week Ended July 30, 1927

DIPHTHERIA	Cases
District of Columbia	18

MEASLES	
District of Columbia	1
North Dakota	3

MENINGOCOCCUS MENINGITIS	
North Dakota	1

SCARLET FEVER	Cases
District of Columbia	9
North Dakota	11

SMALLPOX	
North Dakota	1

TYPHOID FEVER	
District of Columbia	3
North Dakota	1

POLIOMYELITIS IN OHIO

The State Health Department of Ohio reports that 16 cases of poliomyelitis occurred in Martins Ferry, Ohio, up to August 5, 1927. Three cases occurred outside the city. Eight cases and one death were reported in Dennison and Uhrichsville, Tuscarawas County. Nine other cases were reported in the State, widely separated.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
June, 1927										
California	26	511	61	3	2,966	3	75	672	79	62
Missouri	4	106	1	11	487		0	175	95	38
New Hampshire	1	2	73				0	34	0	3
South Dakota	0	13	3	1	142		0	73	25	10
Virginia	2	56	500	141	1,249	63	6	82	54	111
Wisconsin	35	113	85		2,473		3	422	73	14

June, 1927

	Cases
Botulism:	
California	3
Chicken pox:	
California	1,222
Missouri	94
South Dakota	19
Virginia	328
Wisconsin	775
Dysentery:	
California (amebic)	6
California (bacillary)	8
Virginia	834
German measles:	
California	305
Wisconsin	122
Hookworm disease:	
California	2
Virginia	12
Jaundice (epidemic):	
California	3
Leprosy:	
California	5
Missouri	1
Lethargic encephalitis:	
California	6
Wisconsin	1
Malta fever:	
California	1

June, 1927—Continued

	Cases
Mumps:	
California	715
Missouri	294
South Dakota	2
Wisconsin	786
Opthalmia neonatorum:	
California	2
Missouri	5
Paratyphoid fever:	
California	4
Rabies in animals:	
California	37
Missouri	1
Septic sore throat:	
Missouri	5
Tetanus:	
California	8
Trachoma:	
California	13
Missouri	3
South Dakota	3
Whooping cough:	
California	914
Missouri	330
South Dakota	21
Virginia	1,331
Wisconsin	393

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 99 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 30,750,000. The estimated population of the 94 cities reporting deaths is more than 30,000,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended July 23, 1927, and July 24, 1926

	1927	1926	Estimated expectancy
Cases reported			
Diphtheria:			
41 States	1,014	952	----------
99 cities	546	525	540
Measles:			
40 States	2,218	3,630	----------
99 cities	640	954	----------
Poliomyelitis:			
43 States	146	49	----------
Scarlet fever:			
41 States	1,164	1,301	----------
99 cities	380	472	295
Smallpox:			
42 States	303	216	----------
99 cities	61	33	54
Typhoid fever:			
41 States	962	822	----------
99 cities	114	102	153
Deaths reported			
Influenza and pneumonia:			
94 cities	341	327	----------

City reports for week ended July 23, 1927

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding week of the preceding years. When the reports include several epidemics, or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during non-epidemic years.

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1918 is included. In obtaining the estimated expectancy the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	75,333	1	1	2	0	0	0	0	1
New Hampshire:									
Concord	22,546	0	0	0	0	0	1	0	1
Manchester	83,097	0	1	0	0	0	0	0	1
Vermont:									
Barre	10,008	0	0	0	0	0	0	0	0
Burlington	24,089	0	0	0	0	0	2	0	2
Massachusetts:									
Boston	779,620	45	35	17	1	0	63	10	11
Fall River	128,993	4	2	0	0	0	5	0	1
Springfield	142,065	7	1	2	0	0	3	2	1
Worcester	190,757	8	2	1	0	0	2	0	4
Rhode Island:									
Pawtucket	69,760	0	0	1	0	0	0	0	1
Providence	267,918	0	3	2	0	0	1	0	1
Connecticut:									
Bridgeport	(1)	0	4	1	1	0	0	0	1
Hartford	160,197	3	2	1	0	0	0	3	0
New Haven	178,927	1	1	0	0	0	10	0	2

[1] No estimate made.

City reports for week ended July 23, 1927—Continued

Division, State, and city	Population July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
MIDDLE ATLANTIC									
New York:									
Buffalo	538,016	8	8	4	-------	0	3	6	4
New York	5,873,356	112	135	143	4	4	33	46	74
Rochester	316,786	7	4	2	-------	0	0	4	0
Syracuse	182,003	9	3	2	-------	0	48	1	1
New Jersey:									
Camden	128,642	1	2	4	0	0	0	3	1
Newark	452,513	27	7	11	0	0	4	15	6
Trenton	132,020	1	2	0	0	0	0	0	2
Pennsylvania:									
Philadelphia	1,979,364	51	40	29	-------	2	19	31	21
Pittsburgh	631,563	26	12	17	-------	2	70	1	10
Reading	112,707	1	2	2	-------	-------	10	4	0
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	409,333	3	5	8	0	0	3	0	13
Cleveland	936,485	37	17	34	0	0	3	32	13
Columbus	279,836	2	2	6	0	1	0	0	3
Toledo	287,380	8	3	3	0	0	12	1	1
Indiana:									
Fort Wayne	97,846	1	1	1	0	0	1	0	0
Indianapolis	358,819	4	3	5	0	0	4	9	5
South Bend	80,091	0	0	0	0	0	1	0	0
Terre Haute	71,071	0	0	0	0	0	2	1	2
Illinois:									
Chicago	2,995,239	36	54	72	2	1	29	29	27
Springfield	63,923	1	0	0	1	0	1	0	1
Michigan:									
Detroit	1,245,824	33	32	23	1	1	2	7	9
Flint	130,316	4	2	5	0	0	1	0	3
Grand Rapids	153,698	1	2	0	0	0	26	2	0
Wisconsin:									
Kenosha	50,891	1	1	0	0	0	1	3	2
Madison	46,385	6	0	0	0	0	2	0	0
Milwaukee	509,192	22	9	7	3	0	61	20	4
Racine	67,707	1	1	0	0	0	0	1	0
Superior	39,671	0	1	1	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth	110,502	0	1	0	0	0	0	0	0
Minneapolis	425,435	34	10	7	0	0	1	0	3
St. Paul	246,001	7	9	2	0	0	9	0	0
Iowa:									
Des Moines	141,441	0	2	0	0	0	0	0	0
Sioux City	76,411	0	1	0	0	-------	0	1	-------
Waterloo	36,771	0	0	0	0	-------	1	0	-------
Missouri:									
Kansas City	367,481	2	2	3	0	1	1	2	7
St. Joseph	78,342	0	0	1	0	0	0	0	0
St. Louis	821,543	5	18	10	0	0	4	10	-------
North Dakota:									
Fargo	26,403	0	0	0	0	0	0	0	0
Grand Forks	14,811	0	0	0	0	-------	0	0	-------
South Dakota:									
Aberdeen	15,036	4	0	0	0	-------	0	0	-------
Nebraska:									
Lincoln	60,941	0	0	0	0	0	1	6	1
Omaha	211,768	0	4	4	0	0	2	0	0
Kansas:									
Topeka	55,411	0	1	0	0	0	4	2	0
Wichita	88,367	0	0	0	0	0	2	0	0
SOUTH ATLANTIC									
Delaware:									
Wilmington	122,049	0	0	1	0	0	0	0	1
Maryland:									
Baltimore	796,296	22	11	28	1	0	3	4	11
Cumberland	33,741	0	0	0	0	0	0	0	0
Frederick	12,035	0	0	1	0	0	0	0	0

City reports for week ended July 23, 1927—Continued

Division, State, and city	Population July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
SOUTH ATLANTIC—con.									
District of Columbia:									
Washington	497,906	3	4	7	0	0	3	0	6
Virginia:									
Lynchburg	30,395	3	0	2	0	0	0	0	0
Norfolk	(1)		0						
Richmond	186,403	0	2	1	0	0	4	1	3
Roanoke	58,208	1	1	0	0	0	0	0	1
West Virginia:									
Charleston	49,019	0	1	1	1	1	1	0	1
Wheeling	56,208	0	0	0	0	0	1	0	1
North Carolina:									
Raleigh	30,371	0	0	0	0	0	7	0	1
Wilmington	37,061	0	0	0	0	0	14	0	0
Winston-Salem	69,031	0	0	0	0	0	13	3	3
South Carolina:									
Charleston	73,125	0	0	0	6	0	0	0	1
Columbia	41,225	1	0	0	0		20	1	
Greenville	27,311	0	0	0	0	0	1	1	1
Georgia:									
Atlanta	(1)	1	2	2	10	0	2	1	4
Brunswick	16,809	0	0	0	0	0	0	2	0
Savannah	93,134	1	1	1	1	0	1	0	2
Florida:									
Miami	69,754	1		3	0	0	3	2	4
St. Petersburg	26,847	0	0	0	0	0	0	0	0
Tampa	94,743	0	0	1	0	0	3	0	2
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,309	0	1	1	0	0	0	1	0
Louisville	305,935	1	1	0	1	1	0	2	2
Tennessee:									
Memphis	174,533	0	1	1	0	2	1	0	0
Nashville	136,220	1	0	1	0	0	0	0	1
Alabama:									
Birmingham	205,670	0	1	2	0	0	3	0	6
Mobile	65,955	0	0	0	0	0	0	0	0
Montgomery	46,481	0	0	0	0	0	1	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	31,643		0						
Little Rock	74,216	1	0	0	0	0	3	0	0
Louisiana:									
New Orleans	414,493	0	4	9	0	0	3	0	7
Shreveport	57,857	0	1	0	0	0	4	1	2
Oklahoma:									
Oklahoma City	(1)	0	0	1	0	0	1	0	4
Tulsa	124,478	0	1	1	0	0	0	0	0
Texas:									
Dallas	194,450	0	2	3	0	0	2	0	1
Galveston	48,375	0	0	1	0	0	0	0	0
Houston	164,954	0	2	12	0	0	1	0	1
San Antonio	198,069	0	1	5	0	0	0	0	4
MOUNTAIN									
Montana:									
Billings	17,971	2	0	0	0	0	1	0	0
Great Falls	29,883	2	1	0	0	0	3	0	0
Helena	12,037	0	0	0	0	0	0	0	0
Missoula	12,668	1	0	0	0	0	0	0	1
Idaho:									
Boise	28,042	0	0	1	0	0	0	1	0
Colorado:									
Denver	280,911	5	8	10		1	5	6	4
Pueblo	43,787	0	1	0	0	0	0	0	0
New Mexico:									
Albuquerque	21,000	0	1	0	0	0	1	1	2
Utah:									
Salt Lake City	130,948	10	2	0	0	0	2	1	0
Nevada:									
Reno	12,665	0	0	0	0	0	0	0	0

[1] No estimate made.

City reports for week ended July 23, 1927—Continued

Division, State, and city	Population July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
PACIFIC									
Washington									
Seattle	(1)	4	4	1			72	5	
Spokane	108,897	9	0	0			0	0	
Tacoma	104,455	7	2	2	0	0	4	0	1
California:									
Los Angeles	(1)	16	32	16	3	1	19	5	16
Sacramento	72,260	2	2	3	0	0	2	0	1
San Francisco	557,530	3	10	3	1	0	10	9	3

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
NEW ENGLAND											
Maine:											
Portland	0	0	0	0	0	2	0	0	0	1	26
New Hampshire:											
Concord	0	0	0	0	0	2	0	0	0	0	10
Manchester	0	0	0	0	0	1	0	0	0	0	15
Vermont:											
Barre	0	0	0	0	0	1	0	0	0	0	1
Burlington	0	0	0	0	0	0	0	0	0	0	3
Massachusetts:											
Boston	18	28	0	0	0	18	2	2	0	26	151
Fall River	1	2	0	0	0	2	1	0	0	1	23
Springfield	1	1	0	0	0	2	0	0	0	1	29
Worcester	2	3	0	0	0	4	0	5	1	11	52
Rhode Island:											
Pawtucket	0	1	0	0	0	1	0	0	0	0	21
Providence	2	7	0	0	0	1	1	0	0	0	49
Connecticut:											
Bridgeport	2	1	0	0	0	1	0	0	1	0	31
Hartford	1	0	0	0	0	0	1	0	0	5	40
New Haven	1	0	0	0	0	1	1	0	0	0	34
MIDDLE ATLANTIC											
New York:											
Buffalo	7	8	0	0	0	9	0	0	0	14	107
New York	41	45	0	0	0	[2] 83	25	12	5	148	1,151
Rochester	3	6	0	0	0	3	0	0	0	1	51
Syracuse	2	0	0	0	0	1	0	0	0	0	38
New Jersey:											
Camden	1	1	0	0	0	1	0	0	0	0	31
Newark	6	5	0	0	0	4	1	0	0	50	74
Trenton	0	1	1	0	0	2	0	1	0	0	33
Pennsylvania:											
Philadelphia	24	24	1	0	0	29	8	3	1	34	454
Pittsburgh	10	11	0	0	0	3	2	1	0	18	102
Reading	0	0	0	0	0	1	0	0	0	6	16
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	4	3	1	1	0	11	2	1	0	10	130
Cleveland	13	5	2	0	0	16	2	2	0	51	163
Columbus	2	1	0	1	0	4	1	0	0	9	76
Toledo	3	1	1	0	0	2	1	5	0	27	52
Indiana:											
Fort Wayne	1	1	0	1	0	0	1	1	0	4	21
Indianapolis	2	3	1	7	0	9	1	0	0	5	85
South Bend	0	1	1	0	0	1	0	0	0	5	16
Terre Haute	1	1	0	0	0	1	0	1	0	1	11

[1] No estimate made.

[2] Pulmonary tuberculosis only.

City reports for week ended July 23, 1927—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
EAST NORTH CENTRAL—con.											
Illinois:											
Chicago	29	52	1	0	0	35	5	5	0	164	534
Springfield	0	0	1	2	0	0	0	0	0	0	18
Michigan:											
Detroit	26	23	3	5	0	22	5	3	0	145	194
Flint	2	6	1	0	0	2	0	0	0	6	21
Grand Rapids	3	2	0	1	0	0	0	0	0	1	25
Wisconsin:											
Kenosha	1	2	1	0	0	1	0	0	0	1	5
Madison	1	2	0	0	0	1	0	0	0	6	22
Milwaukee	9	8	1	1	0	4	0	0	0	34	84
Racine	2	1	0	0	0	2	0	0	0	2	17
Superior	1	3	1	0	0	0	0	0	0	0	7
WEST NORTH CENTRAL											
Minnesota:											
Duluth	3	4	1	0	0	2	1	0	0	2	21
Minneapolis	10	10	3	0	0	3	1	0	0	4	71
St. Paul	6	11	2	0	0	0	1	0	0	6	45
Iowa:											
Des Moines	1	1	0	2	0	2	0	0	0	0	34
Sioux City	0	1	0	1	----	----	0	2	----	9	----
Waterloo	1	1	0	0	----	----	0	0	----	4	----
Missouri:											
Kansas City	2	0	1	0	0	9	2	1	0	17	83
St. Joseph	0	1	0	4	1	0	1	0	0	5	9
St. Louis	6	4	1	1	0	8	7	2	1	45	193
North Dakota:											
Fargo	0	7	1	0	0	1	0	0	0	0	5
Grand Forks	0	4	0	0	----	----	0	0	----	0	----
South Dakota:											
Aberdeen	1	0	0	0	----	----	0	0	----	2	----
Nebraska:											
Lincoln	0	0	0	1	0	1	1	1	0	4	9
Omaha	1	0	2	0	0	3	0	0	0	1	50
Kansas:											
Topeka	1	1	1	0	0	1	0	2	0	24	7
Wichita	1	0	0	0	0	2	1	0	0	20	31
SOUTH ATLANTIC											
Delaware:											
Wilmington	0	1	0	0	0	3	1	0	0	2	29
Maryland:											
Baltimore	6	8	0	0	0	23	7	3	0	62	189
Cumberland	0	0	0	0	0	0	1	0	0	0	17
Frederick	0	0	0	0	0	0	0	0	0	0	7
District of Col.:											
Washington	4	5	0	1	0	10	4	5	1	4	124
Virginia:											
Lynchburg	0	0	0	0	0	0	1	4	0	5	7
Norfolk	0	----	0	----	----	----	2	----	----	----	----
Richmond	1	2	0	0	0	5	2	0	0	6	56
Roanoke	1	2	1	0	0	0	1	0	0	1	19
West Virginia:											
Charleston	0	0	0	1	0	1	1	0	0	2	20
Wheeling	0	0	0	0	0	0	0	0	0	0	14
North Carolina:											
Raleigh	0	0	0	0	0	1	1	1	0	6	21
Wilmington	0	0	0	0	0	0	0	0	0	0	10
Winston-Salem	1	1	1	0	0	0	2	5	1	12	26
South Carolina:											
Charleston	0	0	0	1	0	2	2	0	0	----	20
Columbia	0	0	0	0	0	0	1	1	0	11	12
Greenville	0	0	1	0	0	0	1	0	0	1	5
Georgia:											
Atlanta	1	2	2	3	0	5	3	7	0	5	39
Brunswick	0	0	0	0	0	0	0	0	0	0	1
Savannah	0	0	0	0	0	0	2	0	0	0	28

City reports for week ended July 23, 1927—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
SOUTH ATLANTIC—continued											
Florida:											
Miami	1	0	0	0	0	2	----	1	1	0	37
St. Petersburg	0	0	0	0	0	0	0	0	0	0	10
Tampa	0	0	0	0	0	1	1	0	0	0	35
EAST SOUTH CENTRAL											
Kentucky:											
Covington	0	2	0	0	0	1	1	0	0	0	16
Louisville	1	1	0	0	0	5	5	2	0	1	81
Tennessee:											
Memphis	0	3	0	4	0	10	6	8	2	2	64
Nashville	0	0	0	0	0	0	6	7	0	2	44
Alabama:											
Birmingham	1	0	1	3	0	2	5	4	1	8	59
Mobile	0	0	0	0	0	0	2	1	0	0	16
Montgomery	0	0	0	0	0	0	2	2	0	0	----
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	----	0	----	----	----	0	----	----	----	----
Little Rock	0	0	0	0	0	7	3	0	0	0	10
Louisiana:											
New Orleans	1	5	0	0	0	6	4	6	2	9	133
Shreveport	0	0	0	0	0	3	0	3	0	0	32
Oklahoma:											
Oklahoma City	0	0	1	0	0	2	2	2	0	0	40
Tulsa	1	0	0	0	----	----	4	0	----	0	----
Texas:											
Dallas	1	1	1	0	0	3	3	1	1	4	----
Galveston	0	1	0	0	0	0	0	0	2	0	8
Houston	0	4	1	2	0	4	2	0	0	0	70
San Antonio	1	0	0	0	0	5	1	1	1	0	70
MOUNTAIN											
Montana:											
Billings	0	0	0	1	0	0	1	0	0	12	7
Great Falls	0	2	1	0	0	0	0	0	0	0	5
Helena	0	0	0	0	0	0	0	0	0	0	4
Missoula	1	2	1	0	0	0	0	0	0	2	5
Idaho:											
Boise	0	0	1	1	0	0	0	0	0	2	5
Colorado:											
Denver	5	0	2	1	0	8	1	2	0	7	53
Pueblo	1	5	0	0	0	0	0	0	0	0	7
New Mexico:											
Albuquerque	0	0	0	0	0	6	0	0	0	0	16
Utah:											
Salt Lake City	1	2	0	10	0	0	0	1	0	18	30
Nevada:											
Reno	0	0	0	0	0	0	0	0	0	0	5
PACIFIC											
Washington:											
Seattle	4	3	3	1	----	----	0	1	----	11	----
Spokane	1	4	3	7	----	----	0	0	----	4	----
Tacoma	1	1	2	0	0	0	0	1	0	0	18
California:											
Los Angeles	8	21	4	0	0	21	4	2	0	15	253
Sacramento	1	0	0	0	0	2	2	1	1	4	23
San Francisco	4	6	1	0	0	12	1	1	0	16	156

City reports for week ended July 23, 1927—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston	2	0	0	0	0	0	0	3	0
MIDDLE ATLANTIC									
New York:									
New York	2	2	7	4	0	0	3	5	1
Pennsylvania:									
Philadelphia	0	0	1	1	0	0	1	2	0
Pittsburgh	0	0	0	0	0	0	1	1	1
EAST NORTH CENTRAL									
Ohio:									
Cleveland	1	1	0	0	0	0	1	0	0
Columbus	1	1	0	1	0	0	0	0	0
Illinois:									
Chicago	5	3	2	0	0	0	2	5	1
Michigan:									
Detroit	5	1	2	0	0	0	0	0	0
Wisconsin:									
Milwaukee	4	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth	1	0	0	0	0	0	0	0	0
Minneapolis	3	0	0	1	0	0	0	0	0
Missouri:									
Kansas City	0	0	0	0	0	0	0	1	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	0	0	0	0	1	0	1	0	0
District of Columbia:									
Washington	0	1	0	1	0	0	0	0	0
Virginia:									
Richmond	0	0	0	0	0	1	0	0	0
North Carolina:									
Winston-Salem	0	0	0	0	0	1	0	0	0
South Carolina:									
Charleston [1]	0	0	0	0	2	0	0	1	0
Georgia:									
Atlanta	0	0	0	0	1	0	0	2	0
Savannah [1, 2]	0	0	0	0	1	1	0	0	0
EAST SOUTH CENTRAL									
Kentucky:									
Louisville	0	0	0	0	0	0	0	1	0
Alabama:									
Birmingham	0	0	0	1	0	0	1	0	0
Mobile [2]	0	0	0	0	0	1	0	0	0
Montgomery	0	0	0	0	3	0	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Little Rock	0	0	0	0	0	2	0	0	0
Louisiana:									
New Orleans	0	0	1	1	3	1	0	4	0
Shreveport	0	0	0	0	0	2	0	0	0
Oklahoma:									
Oklahoma City	0	0	0	0	1	0	0	0	0
Texas:									
Dallas	0	0	0	0	1	0	1	2	2
Houston	1	1	0	0	0	0	0	0	0
MOUNTAIN									
Montana:									
Missoula	1	1	0	0	0	0	0	0	0

[1] Dengue: Charleston, S. C., 3 cases; Savannah, Ga., 1 case.
[2] Typhus fever: Savannah, Ga., 2 cases; Tampa, Fla., 1 case; Mobile, Ala., 1 death.

City reports for week ended July 23, 1927—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
PACIFIC									
Washington:									
Tacoma	0	1	0	0	0	0	0	0	0
California:									
Los Angeles	0	0	0	0	1	0	1	10	6
Sacramento	3	2	0	0	0	0	0	1	0
San Francisco	1	1	0	0	0	0	1	7	1

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended July 23, 1927, compared with those for a like period ended July 24, 1926. The population figures used in computing the rates are approximate estimates as of July 1, 1926 and 1927, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 30,445,000 in 1926 and 30,966,000 in 1927. The 95 cities reporting deaths had nearly 29,785,000 estimated population in 1926 and nearly 30,296,000 in 1927. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, June 19 to July 23, 1927—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	June 26, 1926	June 25, 1927	July 3, 1926	July 2, 1927	July 10, 1926	July 9, 1927	July 17, 1926	July 16, 1927	July 24, 1926	July 23, 1927
101 cities	130	162	[2] 122	140	102	[3] 123	94	[4] 115	90	[5] 93
New England	59	116	64	88	57	[6] 92	78	132	33	63
Middle Atlantic	152	270	164	212	120	197	101	165	109	106
East North Central	162	132	117	119	106	102	110	93	98	108
West North Central	192	46	125	60	93	[7] 39	107	54	95	54
South Atlantic	45	107	82	143	65	[8] 86	32	83	34	[9] 87
East South Central	10	36	[2] 22	20	5	41	21	36	10	25
West South Central	43	67	47	122	43	[10] 52	26	[10] 73	39	[10] 129
Mountain	118	153	155	126	118	108	109	[11] 108	64	99
Pacific	131	113	129	76	179	86	158	113	174	65

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1926 and 1927, respectively.
[2] Covington, Ky., not included.
[3] Bridgeport, Conn., Sioux City, Iowa, Savannah, Ga., and Fort Smith, Ark., not included.
[4] Fort Smith, Ark., and Denver, Colo., not included.
[5] Norfolk, Va., and Fort Smith, Ark., not included.
[6] Bridgeport, Conn., not included.
[7] Sioux City, Iowa, not included.
[8] Savannah, Ga., not included.
[9] Norfolk, Va., not included.
[10] Fort Smith, Ark., not included.
[11] Denver, Colo., not included.

Summary of weekly reports from cities, June 19 to July 23, 1927—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926—Continued

MEASLES CASE RATES

	Week ended—									
	June 26, 1926	June 25, 1927	July 3, 1926	July 2, 1927	July 10, 1926	July 9, 1927	July 17, 1926	July 16, 1927	July 24, 1926	July 23, 1927
101 cities	619	302	[2] 461	272	311	[3] 196	226	[4] 155	164	[5] 109
New England	425	327	318	341	245	[6] 322	179	241	108	197
Middle Atlantic	477	247	314	201	211	154	129	122	108	92
East North Central	838	214	739	206	481	182	412	110	279	90
West North Central	942	216	605	204	417	[7] 88	192	105	184	48
South Atlantic	695	531	432	447	291	[8] 249	201	221	127	[9] 141
East South Central	610	132	[2] 428	82	284	76	171	61	124	25
West South Central	95	130	52	151	47	[10] 116	17	[10] 108	13	[10] 56
Mountain	703	450	437	494	264	135	191	[11] 251	173	99
Pacific	482	843	458	775	335	589	327	448	212	280

SCARLET FEVER CASE RATES

101 cities	212	100	[2] 170	128	127	[3] 100	94	[4] 83	82	[5] 64
New England	236	237	186	221	158	[6] 182	99	130	85	109
Middle Atlantic	210	223	188	149	129	123	73	91	75	50
East North Central	251	209	187	132	145	91	119	89	89	75
West North Central	337	159	270	89	206	[7] 94	186	71	127	79
South Atlantic	151	96	65	82	63	[8] 56	45	56	35	[9] 41
East South Central	47	82	[2] 66	56	52	46	52	31	98	31
West South Central	30	38	60	17	34	[10] 43	52	[10] 39	82	[10] 47
Mountain	118	441	91	208	55	117	91	[11] 197	64	99
Pacific	158	139	150	86	121	60	94	50	91	92

SMALLPOX CASE RATES

101 cities	16	16	[2] 11	18	7	[3] 16	7	[4] 9	6	[5] 10
New England	0	0	0	0	0	[6] 0	0	0	0	0
Middle Atlantic	0	0	2	0	0	0	1	0	0	0
East North Central	14	12	10	21	7	15	6	17	8	13
West North Central	44	58	26	38	28	[7] 33	26	14	14	12
South Atlantic	26	29	11	18	9	[8] 24	6	9	6	[9] 12
East South Central	88	58	[2] 38	36	0	51	5	25	10	36
West South Central	17	13	21	13	4	[10] 0	13	[10] 9	13	[10] 9
Mountain	18	90	55	63	9	45	9	[11] 72	27	117
Pacific	32	21	19	73	24	73	21	13	8	21

TYPHOID FEVER CASE RATES

101 cities	12	11	[2] 16	15	13	[3] 17	22	[4] 21	18	[5] 19
New England	9	2	12	7	9	[6] 15	12	19	9	16
Middle Atlantic	10	4	11	6	7	8	11	11	9	8
East North Central	4	6	5	5	5	5	6	8	6	9
West North Central	4	6	10	8	16	[7] 10	14	16	12	14
South Atlantic	30	40	35	22	43	[8] 36	58	43	47	[9] 50
East South Central	36	61	[2] 126	132	52	163	165	153	134	122
West South Central	30	21	13	75	30	[10] 17	56	[10] 52	30	[10] 47
Mountain	0	18	27	9	0	18	0	[11] 36	46	27
Pacific	16	8	21	16	13	10	21	8	8	16

[2] Covington, Ky., not included.
[3] Bridgeport, Conn., Sioux City, Iowa, Savannah, Ga., and Fort Smith, Ark., not included.
[4] Fort Smith, Ark., and Denver, Colo., not included.
[5] Norfolk, Va., and Fort Smith, Ark., not included.
[6] Bridgeport, Conn., not included.
[7] Sioux City, Iowa, not included.
[8] Savannah, Ga., not included.
[9] Norfolk, Va., not included.
[10] Fort Smith, Ark., not included.
[11] Denver, Colo., not included.

Summary of weekly reports from cities, June 19 to July 23, 1927—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926—Continued

INFLUENZA DEATH RATES

	Week ended—									
	June 26, 1926	June 25, 1927	July 3, 1926	July 2, 1927	July 10, 1926	July 9, 1927	July 17, 1926	July 16, 1927	July 24, 1926	July 23, 1927
95 cities	5	7	[2] 6	3	4	[12] 3	4	[12] 3	3	[9] 3
New England	0	5	5	5	7	[8] 2	0	5	2	0
Middle Atlantic	6	6	7	2	1	4	4	2	2	4
East North Central	3	5	5	3	7	3	4	1	4	2
West North Central	6	10	8	2	0	0	0	2	2	2
South Atlantic	6	2	8	6	0	[9] 4	6	6	4	[9] 2
East South Central	5	25	[2] 0	0	16	15	21	5	5	15
West South Central	22	4	13	4	4	[14] 0	9	[13] 10	9	0
Mountain	0	27	9	9	0	0	9	18	9	9
Pacific	0	10	4	3	4	3	4	7	4	3

PNEUMONIA DEATH RATES

95 cities	73	74	[2] 75	73	67	[12] 60	60	[12] 57	54	[9] 56
New England	68	86	92	80	54	[8] 60	57	56	33	56
Middle Atlantic	83	85	90	71	73	64	74	61	64	59
East North Central	60	71	61	80	65	49	46	45	47	55
West North Central	44	52	38	77	53	54	36	31	40	21
South Atlantic	95	46	89	57	72	[9] 59	55	63	57	[9] 75
East South Central	124	56	[2] 121	97	119	82	109	66	98	46
West South Central	71	43	53	73	53	[14] 99	79	[13] 78	53	65
Mountain	109	54	46	90	36	99	36	197	64	45
Pacific	42	131	42	69	53	55	46	97	35	72

[2] Covington, Ky., not included.
[8] Bridgeport, Conn., not included
[9] Savannah, Ga., not included.
[9] Norfolk, Va., not included.
[12] Bridgeport, Conn., Savannah, Ga., Dallas, Tex., and San Antonio, Tex., not included.
[13] Dallas, Tex., not included.
[14] Dallas, Tex., and San Antonio, Tex., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1926 and 1927, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1926	1927	1926	1927
Total	101	95	30,443,800	30,966,700	29,783,700	30,295,900
New England	12	12	2,211,000	2,245,900	2,211,000	2,245,900
Middle Atlantic	10	10	10,457,000	10,567,000	10,457,000	10,567,000
East North Central	16	16	7,650,200	7,810,600	7,650,200	7,810,600
West North Central	12	10	2,585,500	2,628,600	2,470,600	2,510,000
South Atlantic	21	20	2,799,500	2,878,100	2,757,700	2,835,700
East South Central	7	7	1,008,300	1,023,500	1,008,300	1,023,500
West South Central	8	7	1,213,800	1,243,300	1,181,500	1,210,400
Mountain	9	9	572,100	580,000	572,100	580,000
Pacific	6	4	1,946,400	1,991,700	1,475,300	1,512,800

FOREIGN AND INSULAR

PLAGUE ON VESSEL

Greek Warship "Avoroff"—At the port of Athens, Greece—June 24-30, 1927.—During the week ended June 30, 1927, a case of plague was reported on the Greek warship *Avoroff*, at the port of Athens.

PLAGUE RATS ON VESSEL

Steamship Plutarch at London from Rio de La Plata.—The steamship *Plutarch* arrived at London from South American ports June 26, 1927. On June 30, 1927, the presence of plague rats on board was reported to the Ministry of Health. The diagnosis of plague in these rats has since been officially confirmed. The ship is said to have touched at the following ports: Bahia, Rio de Janeiro, Santos, Rio Grande, Rosario, Buenos Aires. The cargo consisted of flour, maize, wheat, and cased meats. No unusual mortality among rats was observed during the voyage, but dead rats were found during the discharge of the cargo and certain of them were found to be plague infected on bacteriological examination. As soon as the diagnosis was established, fumigation was undertaken with part of the cargo on board, after which many dead rats were found. The ship was again fumigated when empty and was then declared to be free from infection.

THE FAR EAST

Report for week ended July 16, 1927.—The following report for the week ended July 16, 1927, was transmitted by the Eastern Bureau of the Health Section of the Secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva.

Maritime towns	Plague		Cholera		Smallpox	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Egypt: Port Said	1	0	0	0	0	0
British India:						
Karachi	----	0	----	0	1	0
Bombay	----	2	----	2	18	11
Madras	----	0	----	0	1	0
Calcutta	----	3	----	13	19	13
Bassein	----	5	----	0	0	0
Rangoon	----	0	----	0	8	2
Siam: Bangkok	0	0	1	0	0	0
Dutch East Indies:						
Surabaya	0	0	0	0	1	0
Banjermasin	0	0	0	0	27	0
French Indo-China:						
Saigon and Cholon	0	0	2	0	0	0
Tourane	0	0	1	0	0	0
China: Canton	0	0	3	2	0	0
Manchuria: Mukden	0	0	0	0	1	0
Japan: Nagasaki	0	0		0	3	4

Telegraphic reports from the following maritime towns indicated that no case of plague, cholera, or smallpox was reported during the week:

ASIA

Arabia.—Jeddah, Aden, Perim.
Iraq.—Basra.
Persia.—Mohammerah, Bender-Abbas, Bushire, Lingah.
Ceylon.—Colombo.
British India.—Chittagong, Cochin, Tuticorin, Negapatam, Vizagapatam, Moulmein.
Portuguese India.—Nova Goa.
Federated Malay States.—Port Swettenham.
Straits Settlements.—Singapore, Penang.
Dutch East Indies.—Batavia, Banjermasin, Pontianak, Semarang, Menado, Cheribon, Makassar, Balikpapan, Padang, Palembang, Belawan-Deli, Tarakan, Sabang, Samarinda.
French Indo-China.—Haiphong.
Sarawak.—Kuching.
British North Borneo.—Sandakan, Jesselton, Kudat, Tawao.
Portuguese Timor.—Dilly.
Philippine Islands.—Manila, Iloilo, Jolo, Cebu, Zamboanga.
Hong Kong.
China.—Amoy, Shanghai, Tientsin, Tsingtao.
Macao.
Formosa.—Keelung, Takao.
Chosen.—Chemulpo, Fusan.
Manchuria.—Yingkow, Antung, Harbin, Changchun.
Kwantung.—Port Arthur, Dairen.
Japan.—Yokohama, Niigata, Shimonoseki, Moji, Tsuruga, Kobe, Osaka, Hakodate.

AUSTRALASIA AND OCEANIA

Australia.—Adelaide, Melbourne, Sydney, Brisbane, Rockhampton, Townsville, Port Darwin, Broome, Fremantle, Carnarvon, Thursday Island, Cairns.
New Guinea.—Port Moresby.
New Britain Mandated Territory.—Rabaul and Kokopo.
New Zealand.—Auckland, Wellington, Christchurch, Invercargill, Dunedin.
Samoa.—Apia.
New Caledonia.—Nouméa.
Fiji.—Suva.
Hawaii.—Honolulu.
Society Islands.—Papeete.

AFRICA

Egypt.—Alexandria, Suez.
Anglo-Egyptian Sudan.—Port Sudan, Suakin.
Eritrea.—Massaua.
French Somaliland.—Djibouti.
British Somaliland.—Berbera.
Italian Somaliland.—Mogadiscio.
Zanzibar.—Zanzibar.
Kenya.—Mombasa.
Tanganyika.—Dar-es-Salaam.
Seychelles.—Victoria.
Portuguese East Africa.—Mozambique, Beira, Lourenço-Marques.
Union of South Africa.—East London, Port Elizabeth, Cape Town, Durban.
Reunion.—Saint Denis.
Mauritius.—Port Louis.
Madagascar.—Majunga, Tamatave, Diégo-Suarez.

AMERICA

Panama.—Colon, Panama.

Reports had not been received in time for publication from:

Arabia.—Kamaran.
Union of Socialist Soviet Republics.—Vladivostok.

Belated information:

Week ended July 2: *Banjermasin*, 5 smallpox cases.
Week ended July 9: *Karikal*, 2 fatal cholera cases.

Movement of infected ships:

Batavia.—The pilgrim ship *Armanestan* arrived from Jeddah on July 5 infected with smallpox.
Singapore.—The pilgrim ship *Tangistan* arrived on July 10 and the *Ternate* on July 11, both from Jeddah and infected with smallpox.

Other epidemiological information:

The Sanitary Maritime and Quarantine Council of Egypt reports that, during the week ending Wednesday, July 20, 6,256 pilgrims arrived at El Tor, of which 70 had come from Jeddah and 6,186 from Yambo. Among these was one case of smallpox, an Egyptian woman; no other infectious disease occurred. The representative of the Sanitary Maritime and Quarantine Council reports that the health conditions at Medina are satisfactory except for the occurrence of a few cases of smallpox.

The total number of pilgrims who have passed through El Tor since June 20 is 16,056, of whom 10,151 were Egyptians.

ARGENTINA

Plague—Interior—August 1, 1927.—Under date of August 1, 1927, plague was reported present in the interior of the Republic of Argentina, with one case at Entre Rios and two cases at Pampa.

CANADA

Communicable diseases—Quebec—Week ended July 30, 1927.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended July 30, 1927, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	2	Scarlet fever	37
Chicken pox	3	Tuberculosis	29
Diphtheria	33	Typhoid fever	46
Influenza	1	Whooping cough	12
Measles	21		

Typhoid fever—Montreal—January 2-July 23, 1927.—The following table gives the cases of typhoid fever and deaths from this disease reported at Montreal, Quebec, Canada, since January 1, 1927:

Week ended—	Cases	Deaths	Week ended—	Cases	Deaths
Jan. 8, 1927	3	1	Apr. 23, 1927	125	43
Jan. 15, 1927	4	3	Apr. 30, 1927	105	23
Jan. 22, 1927	1	2	May 7, 1927	106	19
Jan. 29, 1927	3	1	May 14, 1927	367	16
Feb. 5, 1927	1	0	May 21, 1927	770	26
Feb. 12, 1927	0	0	May 28, 1927	353	38
Feb. 19, 1927	1	2	June 4, 1927	239	37
Feb. 26, 1927	1	1	June 11, 1927	128	36
Mar. 5, 1927	9	1	June 18, 1927	86	----
Mar. 12, 1927	203	4	June 25, 1927	75	23
Mar. 19, 1927	383	14	July 2, 1927	66	21
Mar. 26, 1927	568	22	July 9, 1927	52	10
Apr. 2, 1927	649	48	July 16, 1927	39	4
Apr. 9, 1927	386	40	July 23, 1927	22	9
Apr. 16, 1927	175	38			

Vital statistics—Quebec—May, 1927.—Births and deaths in the Province of Quebec for the month of May, 1927, were reported as follows:

Estimated population	2,604,000
Births	7,174
Birth rate per 1,000 population	33.06
Deaths	3,174
Death rate per 1,000 population	14.63
Deaths under 1 year	832
Infant mortality rate	115.97
Deaths from:	
Accidents (all)	80
Cancer	132
Cerebrospinal meningitis	2
Diabetes	23
Diarrhea	152
Diphtheria	38
Heart disease	302
Influenza	73
Measles	33
Pneumonia	244
Poliomyelitis (infantile paralysis)	2

Deaths from—Continued.	
Scarlet fever	6
Syphilis	7
Tuberculosis (pulmonary)	235
Tuberculosis (other forms)	68
Typhoid fever	161
Whooping cough	42

DAHOMEY (WEST AFRICA)

Yellow fever—Porto Novo—July 1, 1927.—A fatal case of yellow fever occurring in a Syrian woman, was reported at Porto Novo, Dahomey, July 1, 1927.

FRENCH GUINEA

Smallpox—Beyla—July 4–10, 1927.—During the week ended July 10, 1927, 9 cases of smallpox were reported at Beyla, French Guinea.

HAWAII TERRITORY

Rodent operations—Island of Hawaii—June, 1927.—During the month of June, 1927, 9,048 rodents were examined and none was found plague infected. The last case of rodent plague was reported July 24, 1926, from Hamakua, Hawaii.

Last case of human plague was reported May 23, 1927.

LATVIA

Communicable diseases—May, 1927.—During the month of May, 1927, cases of communicable diseases were reported in the Republic of Latvia, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	8	Paratyphoid fever	4
Diphtheria	50	Puerperal fever	2
Dysentery	4	Scarlet fever	282
Erysipelas	21	Tetanus	2
Influenza	93	Trachoma	28
Leprosy	1	Typhoid fever	42
Lethargic encephalitis	2	Typhus fever	5
Measles	998	Whooping cough	38
Mumps	3		

Population, 1,900,000.

MADAGASCAR

Plague—May 1–15, 1927.—During the period May 1 to 15, 1927, 42 cases of plague, with 37 deaths, were reported in the island of Madagascar. The occurrence was distributed in the four Provinces of Ambositra, Miarinarivo (Itasy), Moramanga, and Tananarive, as follows: Ambositra—cases 6, deaths 6; Miarinarivo (Itasy)—4 cases, 4 deaths; Moramanga—cases and deaths, 2; Tananarive—cases 30, deaths 25. The distribution of cases according to type was: Bubonic, 21; pneumonic, 10; septicemic, 11. The distribution of mor-

tality according to type was: Bubonic, 17 deaths; pneumonic, 9; septicemic, 11.

MALTA

Communicable diseases—June 1–30, 1927.—During the month of June, 1927, communicable diseases were reported in the Island of Malta, as follows:

Disease	Cases	Disease	Cases
Bronchopneumonia	5	Pneumonia	13
Chicken pox	3	Poliomyelitis	2
Diphtheria	1	Puerperal fever	2
Erysipelas	2	Scarlet fever	2
Influenza	1	Trachoma	32
Lethargic encephalitis	1	Tuberculosis	18
Malta fever	69	Typhoid fever	81
Measles	1	Whooping cough	49

Population, civil, 227,440.

SENEGAL

Plague—Smallpox—July 4–10, 1927.—During the week ended July 10, 1927, plague was reported in Senegal, West Africa, as follows: Cayor frontier—cases 7, deaths, 5; Dakar—cases 5, deaths, 3; region of M'Bour—2 fatalities among 30 suspect cases; region of Pout—1 case; Rufisque—20 cases, 18 deaths, in suburb of Guindel.

During the same period, 7 cases of smallpox were reported at Medina, a suburb of Dakar.

YUGOSLAVIA

Communicable diseases—June, 1927.—During the month of June, 1927, communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	29	4	Measles	1,319	17
Cerebrospinal meningitis	5	2	Rabies	1	1
Diphtheria	103	13	Scarlet fever	451	68
Dysentery	69	5	Tetanus	31	11
Influenza	4	----	Typhoid fever	198	19
Lethargic encephalitis	1	1	Typhus fever	7	----
Malta fever	1	1	Whooping cough	314	8

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

The reports contained in the following tables must not be considered as complete or final as regards either the lists of countries included or the figures for the particular countries for which reports are given:

Reports Received During Week Ended August 12, 1927 [1]

CHOLERA

Place	Date	Cases	Deaths	Remarks
China:				
Swatow	June 19–25	5		
India				June 5–11, 1927: Cases, 10,659; deaths, 6,684.
India, French Settlements in	May 1–28	1	1	
Indo-China (French)	Apr. 1–June 30	8,998		
Annam	do	1,147		
Cambodge	do	197		
Cochin-China	do	1,049		
Saigon	June 4–10	1	1	
Tonkin	Apr. 1–June 20	6,605		
Philippine Islands:				
Province—				
Leyte—				
Carigara	June 23	1	1	Final diagnosis not received.
Siam				June 12–18, 1927: Cases, 14; deaths, 12. Apr. 1–June 18, 1927: Cases, 512; deaths, 354.
Bangkok	June 12–18	3	2	

PLAGUE

Argentina	Jan. 1–June 30	71	44	
Entre Rios	Reported Aug. 1	1		
Pampa	do	2		
British East Africa:				
Kenya	June 5–11	4		
Uganda	April, 1927	45	33	
Do	June 5–11	57	50	
Greece:				
Athens	June, 1927	1		Including Piraeus.
India				June 5–11, 1927: Cases, 210; deaths, 194.
Bombay	June 12–18	3	2	
Madras (Presidency)	June 5–11	29	11	
Indo-China (French)	May 11–June 20	14		
Kwang-Chow-Wan	May 21–June 10	57		
Java:				
Batavia	June 12–18	17	17	Province.
East Java and Madura	May 29–June 4	8	8	In native village, Pasoeroean Residency outbreak, June 14, 1927.
Madagascar				May 1–15, 1927: Cases, 42; deaths, 37. Bubonic, cases, 21; deaths, 17. Pneumonic, cases, 10; deaths, 9. Septicemic, cases, 11; deaths, 11.
Province—				
Ambositra	May 1–15	6	6	
Miarinarivo (Itasy)	do	4	4	
Moramanga	do	2	2	
Tananarive	do	30	25	Including town of Tananarive. Cases, 8; deaths, 7.
Senegal				July 4–10, 1927: Cases, 33; deaths, 28.
Cayor frontier	July 4–10	7	5	
Dakar	do	5	3	
M'Bour	do		2	Among 30 suspects, in region.
Pout	do	1		
Rufisque	do	20	18	Suburb of Guindel.
Tunisia	Apr 21–May 31	131		
On vessel:				
S. S. Avoroff	June 24–30	1		At port of Athens, Greece.

SMALLPOX

Algeria	May 11–June 10	365		
Brazil:				
Rio de Janeiro	June 19–25	1	1	
British East Africa:				
Zanzibar	April, 1927	7	2	
British South Africa:				
Northern Rhodesia	June 18–24	26		Natives.

[1] From medical officers of the Public Health Service, American consuls and other sources.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received During Week Ended August 12, 1927—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
Canada:				
Ontario—				
Ottawa	July 17–23	21		
Saskatchewan—				
Regina	do	1		
France	May 1–31	62		
Paris	June 21–30	3	1	
Gold Coast	Apr. 1–30	4		
Guatemala:				
Guatemala City	June, 1927		9	
Guinea (French)	July 4–10	9		
India				June 4–11, 1927: Cases, 4,688; deaths, 1,268.
Bombay	June 12–18	24	19	
Madras	June 26–July 2	6	2	
India, French Settlements in	May 1–21	49	29	
Indo-China (French)	May 11–June 10	46		
Italy	May 8–21	8		
Japan:				
Nagasaki	July 4–10	17	4	
Morocco	May 1–31	39		
Netherlands Indies:				
Borneo—				
Pasir Residency	Apr. 30–May 6			Epidemic outbreak.
Samarainda Residency	May 21–27			Do.
Nigeria	Mar. 1–Apr. 30	1,500	351	
Senegal:				
Medina	July 4–10	7		
Siam				June 12–18, 1927: Cases, 2; deaths, 3.
				Apr. 1–June 18, 1927: Cases, 92; deaths, 25.
Bangkok	June 12–18	1	1	
Straits Settlements	do	3		
Tunisia	May 11–June 10	5		
Union of South Africa:				
Cape Province—				
Elliott District	do			Outbreaks.
Kalanga District	do			Do.

TYPHUS FEVER

Algeria	May 11–June 10	154	13	
Algiers	June 24–30	3		Natives.
Bulgaria	Apr. 1–May 10	93	8	
Greece:				
Athens	June, 1927		9	
Irish Free State (Ireland):				
Cork County	July 3–9	1		
Latvia	May 1–31	5		
Lithuania	Feb. 1–Apr. 30	121	17	
Morocco	May 11–June 10	279		
Poland				May 29–June 4, 1927: Cases, 73; deaths, 11.
Rumania	May 8–14	104	6	
Tunisia	May 11–June 10	59		
Tunis	July 5–11	1		
Union of South Africa:				
Cape Province	June 12–18			Outbreaks.
Natal	do			Do.

YELLOW FEVER

Dahomey (West Africa):				
Porto Novo	July 1	1	1	In Syrian woman.
Gold Coast	Apr. 1–30	8	5	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from June 25 to August 5, 1927 [1]

CHOLERA

Place	Date	Cases	Deaths	Remarks
China:				
Amoy	May 22–28	1	1	
Kulangsu	June 21	1		
Shanghai	June 19–25	2		
Swatow	May 15–June 18	14	8	
India	Apr. 17–June 4			Cases, 38,121; deaths, 21,860.
Bombay	May 8–June 4	2	1	
Calcutta	May 8–June 18	396	247	
Karachi	May 29–June 4	1	1	
Madras	June 19–25	5	3	
Rangoon	May 8–June 18	14	10	
India, French Settlements in	Mar. 30–Apr. 30	4	2	
Indo-China (French):				
Saigon	Apr. 30–June 3	127	92	Including Cholon.
Philippine Islands:				
Bulacan Province	June 7	1		At Mambog, Malalos.
Leyte Province—				
Palo	May 18	1		
Siam	May 1–June 11			Cases, 124; deaths, 62.
Bangkok	do	29	9	

PLAGUE

Argentina:				
Formosa	Reported July 6	3		
Azores:				
St. Michaels Island	May 15–June 3	2		
British East Africa:				
Kenya	Apr. 24–May 7	7	14	
Tanganyika	Mar. 20–May 7		36	
Uganda	Jan. 1–Feb. 28	138	121	
Do	Mar. 27–May 14	72	57	
Canary Islands:				
Laguna District—				
Tejina	June 17	1		
Ceylon:				
Colombo	May 1–June 11	13	8	Plague rats, 4.
Egypt	May 21–June 24			Cases, 6; deaths, 2.
Alexandria	June 4–10	1		
District—				
Biba	do	1		At Nana.
Beni-Souef	do	1		
Port Said	June 24	2	1	
Tanta District	June 4–10	1		
Greece	May 1–31	1	1	
Patras	May 30–June 11	4		
India	Apr. 17–June 4			Cases, 20,994; deaths, 7,728.
Bombay	May 8–June 25	68	61	
Madras	May 1–June 4	57	22	
Rangoon	May 8–June 18	19	17	
Indo-China (French)	Apr. 1–May 10	7		
Iraq:				
Baghdad	Apr. 8–16	3	1	
Java:				
Batavia	May 1–June 11	87	88	Province.
East Java and Madura	May 22–28	6	6	
Pasoerocan Residency	May 9			Outbreak reported at Ngadiwono.
Surabaya	Apr. 17–May 7	24	24	
Madagascar				Mar. 16–Apr. 30, 1927: Cases, 256; deaths, 135.
Province—				
Ambositra	Mar. 16–Apr. 30	57	52	
Antisirabe	do	8	8	
Miarinarivo (Itasy)	do	39	39	
Moramanga	do	12	12	
Tananarive	do	136	120	
Tananarive Town	do	7	8	

[1] From medical officers of the Public Health Service, American consuls, and other sources.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from June 25 to August 5, 1927—Continued

PLAGUE—Continued

Place	Date	Cases	Deaths	Remarks
Peru	Apr.-May 31			Cases, 22; deaths, 8.
Departments—				
Ica	Apr. 1-30	1		
Lambayeque	do	1		
Libertad	Apr. 1-May 31	7	4	
Lima	do	13	4	
Lima City	Apr. 1-30	5	1	
Senegal	May 23-June 26			Cases, 77; deaths, 25.
Baol	June 2-19	4	1	
Dakar	June 20-July 3	13	9	
Façel	July 6	17	8	
Guindel	June 20-26	11	2	
M'Bour	July 6	28	21	
Medina	June 13-19	2	2	
Rufisque	May 23-July 6	59	35	
Thies District	do	27	7	
Tivaouane	June 2-July 6	12	4	
Siam	Apr. 1-June 11			Cases, 9; deaths, 7.
Bangkok	May 8-June 11	2	1	
Tunisia	Reported May 20	15		In districts of Sfax and Susa.
Turkey:				
Constantinople	May 13-19	1		
Union of South Africa:				
Cape Province—				
Maraisburg district	May 1-14	2	2	Native.

SMALLPOX

Algeria	Apr. 21-May 10	168		
Algiers	May 11-June 30	5		
Oran	May 21-July 10	32		
Brazil:				
Rio de Janeiro	May 22-June 18	4	4	
British East Africa:				
Kenya	Apr. 24-May 14	7	14	
Tanganyika	Mar. 29-May 7		22	
British South Africa:				
Northern Rhodesia	Apr. 30-June 3	32		Native.
Canada	June 5-July 16			Cases, 215.
Alberta	June 12-July 16	55		
Calgary	June 12-25	5		
British Columbia—				
Vancouver	May 23-29	2		
Manitoba	June 5-July 16			Cases, 14.
Winnipeg	June 12-July 15	12		
Ontario	June 5-July 16			Cases, 111.
Ottawa	June 12-July 16	34		
Toronto	June 19-July 23	9		
Quebec	do	13		
Saskatchewan	June 12-July 16	29		
Ceylon	May 1-7			Cases, 3; deaths, 1.
China:				
Amoy	May 8-28	1		
Chefoo	May 8-14			Present.
Foochow	May 8-June 11			Do.
Hong Kong	May 8-June 18	13	14	
Manchuria—				
Anshan	May 22-28	1		
Changchun	May 15-June 25	4		
Dairen	May 2-22	6	4	
Fushun	May 15-June 5	9		
Harbin	June 13-19	1		
Mukden	May 22-June 25	3		
Ssupingkai	May 8-June 25	2		
Tientsin	May 8-28	11		
Chosen	Feb. 1-Apr. 30	354	84	
Chinnampo	Apr. 1-May 31	2		
Fusan	Apr. 1-30	1		
Gensan	May 1-31	1		
Seishin	Apr. 1-30	1		
Curaçao	May 29-June 4	1		Alastrim.
Egypt	May 7-June 17			Cases, 17, deaths, 3.
Alexandria	May 21-June 17	4	1	
Cairo	Jan. 22-Feb. 11	4		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from June 25 to August 5, 1927—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
France	Apr. 1–30			Cases, 66.
Paris	May 21–June 30	8	2	
Gold Coast	Mar. 1–30	18	4	
Great Britain:				
England and Wales	May 22–July 9			Cases, 1,654.
Bradford	May 29–June 11	2		
Cardiff	June 19–July 2	4		
Liverpool	do	1		
London	May 15–June 18	2		
Newcastle on Tyne	June 12–July 2	2		
Sheffield	June 12–July 9	18		
Scotland—				
Dundee	May 29–July 2	5		
India	Apr. 17–June 4			Cases, 39,648; deaths, 9,931.
Bombay	May 28–June 25	112	73	
Calcutta	May 8–June 18	270	206	
Karachi	May 15–June 25	8	5	
Madras	May 22–June 25	8	3	
Rangoon	May 8–June 18	125	38	
India, French Settlements in	Mar. 20–Apr. 30	96	59	
Indo-China (French)	Mar. 21–Apr. 10	190		
Saigon	May 14–20	1	1	
Iraq:				
Baghdad	Apr. 10–16	2		
Basra	do	1		
Italy	Apr. 10–May 7	5		
Jamaica	May 29–June 25	9		Reported as alastrim.
Japan	Apr. 3–May 7	19		
Nagasaki City	Reported July 9	20		
Taiwan Island	May 21–31	1		
Java:				
Batavia	May 22–28	1		
East Java and Madura	Apr. 24–30	1		
Latvia	Apr. 1–30	1		
Mexico:				
Durango	June 1–30		1	
La Oroya	Apr. 1–June 30			Present.
San Luis Potosi	May 29–July 16		7	
Tampico	June 1–10	1	1	
Morocco	Apr. 1–30	55		
Netherlands India:				
Borneo—				
Holoe Soengei	Apr. 21			Epidemic in two localities.
Persia:				
Teheran	Feb. 21–Apr. 20		5	
Poland	Apr. 10–May 14	6		
Portugal:				
Lisbon	May 29–July 9	12	1	
Siam	May 1–June 11			Cases, 39; deaths, 8.
Bangkok	May 15–28	4	2	
Spain:				
Valencia	May 29–June 4	2		
Straits Settlements:				
Singapore	Apr. 1–May 28	4	2	
Sumatra:				
Medan	June 5–11	2		
Tunisia	Apr. 1–May 14	5		
Tunis	June 1–10	1		
Union of South Africa:				
Transvaal—				
Barberton District	May 1–7			Outbreaks.

TYPHUS FEVER

Algeria	Apr. 21–May 10	109	16	
Algiers	May 11–June 10	21		
Oran	May 21–June 30	30		
Bulgaria	Mar. 1–31	58	6	
Sofia	June 4–10	1		
Chile:				
Concepcion	May 29–June 4		1	
Ligua	Mar. 16–31	2		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from June 25 to August 5, 1927—Continued

TYPHUS FEVER—Continued

Place	Date	Cases	Deaths	Remarks
China:				
Manchuria—				
Mukden	May 29–June 4	1		
Chosen	Feb. 1–Apr. 30			Cases, 330; deaths, 30.
Chemulpo	May 1–31	4		
Gensan	do	1		
Seoul	Apr. 1–May 31	9		
Czechoslovakia				Apr. 1–30, 1927: Cases, 21.
Egypt	May 28–June 17			Cases, 79; deaths, 16.
Alexandria	May 21–July 1	8	3	
Cairo	Jan. 15–21	1		
Estonia	Apr. 1–30			Case, 1.
Iraq:				
Baghdad	Apr. 24–30	1		
Irish Free State:				
Cork County	July 3–9	1		In urban district.
Latvia	Apr. 1–30	12		
Mexico	Feb. 1–28			Deaths, 26.
Mexico City	May 29–June 11	7		Including municipalities in Federal District.
Morocco	Apr. 1–May 7	249		Cases, 3.
Palestine	May 24–June 6			
Haifa	do	2		
Mahnaim	May 17–23	1		In Safad District.
Safad	May 17–June 20	3		
Peru:				
Arequipa	Apr. 1–30		1	
Poland	Apr. 10–May 21	749	69	
Portugal:				
Lisbon	May 29–June 4	1		
Rumania	Apr. 3–May 7	583	41	
Tunisia	Apr. 22–May 10	78		
Turkey:				
Constantinople	May 13–19		2	
Union of South Africa	Apr. 1–30			Cases, 55; deaths, 8, native. In Europeans, cases, 2.
Cape Province	Apr. 1–May 18	42	5	Outbreaks.
Albany District	June 5–11			Do.
East London	May 22–28	1		Do.
Glen Grey District	May 1–7			Do.
Qumbu District	do			
Natal	Apr. 1–May 21	7	3	
Impendhle District	June 5–11			Do.
Orange Free State	Apr. 1–May 28	5		
Transvaal	Apr. 1–30	1		
Yugoslavia	May 1–31			Cases, 4.

YELLOW FEVER

Liberia:				
Monrovia	May 29–July 8	4	5	
Senegal	May 27			Cases, 3.
M'Bour	May 27–June 19	5	5	
Ouakam	June 2–8	1	1	
Tivaouane	May 27–June 8	5	5	